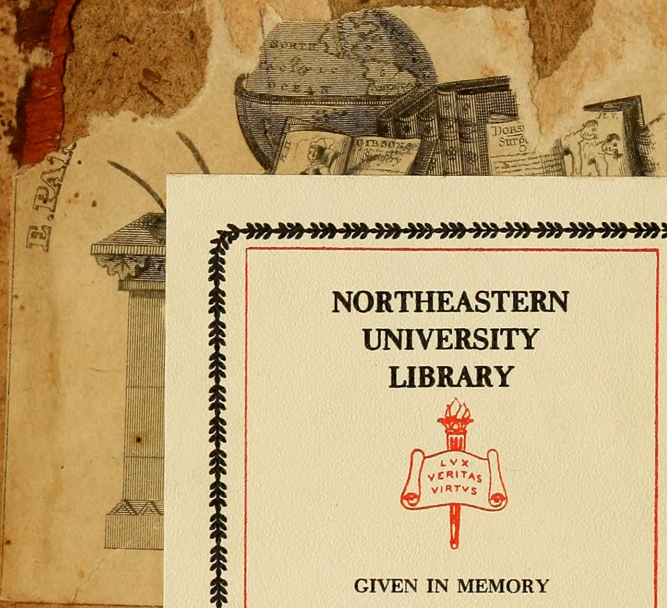

THE AMERICAN DISPENSATORY,

CONTAINING

THE NATURAL, CHEMICAL, PHARMACEUTICAL AND MEDICAL HISTORY OF THE DIFFERENT SUBSTANCES EMPLOYED IN MEDICINE;

TOGETHER WITH

THE OPERATIONS OF PHARMACY;

ILLUSTRATED AND EXPLAINED, ACCORDING TO THE PRINCIPLES OF

MODERN CHEMISTRY:

TO WHICH ARE ADDED,

TOXICOLOGICAL AND OTHER TABLES;

THE

PRESCRIPTIONS FOR PATENT MEDICINES, AND VARIOUS MISCELLANEOUS PREPARATIONS.

FIFTH EDITION.

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ERRATA.

Limm, p. 384, read *Linum.*
Decoctum pro fomenti, p. 259, read *fomento.*
Æther sulphuricus cum alcohol E. aromaticus, read *cum alcohole aromaticus, E.*
Plaster of red oxyd of lead, p. 656, read of *iron.*
Carbonatis zinci, read *carbonas zinci.*

Greek fire Made of Naptha mixe with Sulphur & pitch

PREFACE.

IN a former edition of this work, the Editor earnestly called the attention of Practitioners to the propriety of establishing throughout our extensive country, an uniform standard for their Medicinal preparations and compounds. To a certain extent, this has at length been accomplished by the formation of a Pharmacopœia; which, when duly revised, and corrected in those particulars, in which it is erroneous, will answer the important objects for which it was intended.

Whatever will contribute to facilitate the important operations of Apothecaries, and to lessen the difficulties of the apprentice in acquiring a knowledge of his profession, must be equally beneficial to the community, in diminishing the chances of error and mistakes in which its interests are so closely involved. Under such impressions, the Editor takes the liberty, respectfully to suggest, that some *general* and *uniform* plan should be adopted for the arrangement of their shops; so that in every place, so far at least as local circumstances will permit, the various articles may invariably be found in the same relative locality.

A plan of such a nature, fully matured, by a Committee of their own body, would, we should suppose, be willingly adopted; since independently of being already arranged in a certain way, there can be no particular reason which can influence any one to adhere to any present form of arrangement. The advantages of uniformity would however, undoubtedly be considerable. Every one acquainted with the business, would be *at home* in any shop, whether here or elsewhere; and an engraving of such arrangement, would prove a powerful means of facilitating an apprentice in his attainments, in a much more expeditious manner than at present.

There is another point which may also be here mentioned, and which will equally be useful if carried into effect, to the Physician

who keeps his own medicines, and to the Apothecary. It is well known that mistakes do occasionally take place, by which articles of a poisonous nature have been unintentionally, yet fatally, given for others, not in the least injurious—Tartar Emetic has been thus given for Cream of Tartar;—Oxalic acid,—Nitre, &c. for Glauber's salt; Laudanum instead of Lavender, and so forth. All such mistakes may be readily obviated, by simply agreeing invariably to keep every article of a poisonous nature, in bottles of a different form from those occupied by innocent ones. Let us employ *square bottles* for poisons; and the circumstance of taking hold of one of this form, at once, even in the hands of the youngest student or apprentice, will evince to him, that he has in his hands a dangerous article, and will lead to that attention which is so essentially required. Should these imperfect hints meet the approbation of those for whom they are intended, we may hope that in a short time they may be carried into effectual operation, and the general interests of society, thus be united with those of an individual nature.

As connected in some degree with the interests of the Medical profession, the Editor may be permitted to regret, that no measures have ever yet been taken in this country, to establish a fund for the relief of the *Widows and Orphans* of Practitioners, who are often left destitute by the sudden decease of the head of the family, either from the effects of contagion, or of other causes, to which they may be considered as more peculiarly exposed. Almost every class of citizens have established means of relief for similar contingencies, except our own; and in Great Britain, such an association has long existed. Let us hope that the time is not far distant when so estimable a charity shall exist amongst a class of men, who are always prompt to relieve distress in the line of their profession, without an expectation of pecuniary recompense. To be efficient, it must be *general,* for the cases which require aid are not limited to any particular district.

Philadelphia, January 7, 1822.

MATERIA MEDICA

ET

PRÆPARATA.

EVERY substance employed in the cure of disease, whether in its natural state, or after having undergone various pharmaceutical preparations, belongs to the Materia Medica, in the extended acceptation of the words. But in most Pharmacopœias, the Materia Medica is confined to simples, and to those preparations which are seldom prepared by the apothecary himself; but which are commonly purchased by him, as articles of commerce, from druggists and others.

Systematic authors on this branch of medical knowledge, have bestowed much pains in contriving scientific arrangements of these articles. Some have classed them according to their natural resemblances; others, according to their active constituent principles; and others, according to their real or supposed virtues. Each of these arrangements has its particular advantages. The first will probably be preferred by the natural historian, the second by the chemist, and the last by the physiologist; all the arrangements hitherto adopted are, however, liable to numerous objections. Without entering into the merits or imperfections of either, we may remark, that no adequate reason has been assigned, why the pharmaceutic preparations should not immediately follow the articles, which constitute the basis of these preparations, so as to embrace together, in one view, every thing connected with them. It is the plan heretofore adopted in the former editions of the American Dispensatory, and it is the one herein pursued. To the name admitted by the Pharmacopœia of the United States, or of any of the British Colleges, is subjoined a short view of the natural, medical, and pharmaceutical history of each article.

ACACIÆ GUMMI. *A. L.* Acacia Arabicæ Gummi. *E.*
Gummi Arabicum. *D.*

Acacia Gum. Mimosa Gum. Gum Arabic.

Acacia Vera. L. E. } *Polygamia Monoecia.*
Mimosa Nilotica. D. } Nat. ord. *Lomentaceæ.*

This species of acacia grows in the sandy deserts of Africa, Arabia Petræa, and Egypt. The greatest quantity of pure gum, commonly called Gum-Arabic, is furnished by this tree, from which it exudes either spontaneously, or from incisions made into the bark, and afterwards hardens in the air. But a similar gum may be obtained from all the species of acacia, and from many other trees, such as the Swietenia febrifuga, Melia azadirachta, and the different species of Terminalia. It is remarkable that the barks of all the trees which furnish this bland mucilaginous substance are highly astringent; that of the acacia itself is used in India for tanning; and in our country, the cherry and plumb trees, which sometimes yield a little gum, have very astringent barks.

There are two kinds of gum found in the shops, and sold promiscuously, distinguished by the names of Gum-Arabic, and East-India gum. Gum-Arabic consists of roundish transparent tears, colourless, or of a yellowish colour, shining fracture, without smell or taste, and perfectly soluble in water. The pieces which are most transparent, and have least colour, are reckoned the best. They are sometimes selected from the Gum-Arabic in sorts, and sold for about double the price, under the title of picked gum. The East-India gum is darker coloured than Gum-Arabic, and is not so readily soluble in water. Dr. Duncan possesses a mass of gum, gathered from an acacia in New South Wales, by Mr. Jamieson. It is darker coloured even than East-India gum, and is also less soluble than it; for when suspended in water, it gives off white films, which float through the mucilage. But its most remarkable property is, that it does not precipitate silicized potass; in which respect it agrees, as far as the Doctor's experiments go, with gum collected in the neighbourhood from the common cherry and plumb trees. It is also remarkable, that the coarsest gum forms the thickest mucilage; at least Botany-Bay gum forms a thicker mucilage than East-India gum, and this than Gum-Arabic.

Gum-Arabic was originally brought from Arabia, by the way of Egypt, to Marseilles; and it was not until the beginning of the seventeenth century, that the Dutch made the gum of Senegal known in Europe. After the French got possession of that river, they directed their attention to it, as an important object of commerce, and ascertained, by experiments made in the latter half of the seventeenth century, that gum Senegal was superior to the best gum of Arabia; and for about fifty years it has had the preference.

M. Adanson examined all the gum trees of West Africa with great care, and has given the best description of them. They amount to forty in number; but the three great forests which supply the Se-

negal market consist chiefly of two kinds; one which produces a white gum, called *Vereck,* and another, called *Nebueb*, which yields a red gum.

About the middle of November, that is, after the rainy season, which begins early in July, a gummy juice exudes spontaneously from the trunk and principal branches. In about fifteen days, it thickens in the furrow, down which it runs, either in a vermicular shape, or more commonly assuming the form of round or oval tears, about the size of a pigeon's egg, of different colours, as they belong to the white or red gum-tree. About the middle of December, the Moors encamp on the borders of the forest, and the harvest lasts six weeks. The gum is packed in very large sacks of tanned leather, and brought on camels and bullocks to certain ports, where it is sold to the French and English merchants. In 1787, the annual quantity purchased by the former was about 800,000 pounds, and by the latter 400,000, according to the information of M. Golberry.

Mr. Jackson, in his account of the Empire of Morocco, informs us, that from Mogadore they export two sorts of gum, one the common Gum-Arabic, the produce of Morocco, and called Barbary gum; the other finer, called Gum-Soudan, or Senegal, brought from Timbuctoo by the caravans. He also says, but it must be observed that he is no botanist, that the gum called Morocco or Barbary gum, is produced from a thorny tree called *Attaleh*, having leaves similar to the juniper, whereas all the acacias have pinnated leaves. It yields most gum during the hot and parching heat of July and August; and the hotter the weather, and the more sickly the tree appears, the more gum it yields. A wet winter and a mild summer are unfavourable to gum.

Gum is highly nutritious. During the whole time of the harvest, of the journey, and of the fair, the Moors of the desert live almost entirely upon it; and experience has proved, that six ounces are sufficient for the support of a man during twenty-four hours.

Qualities.—When pure, dry, brittle, transparent, colourless, insipid; by exposure to the air, it undergoes no change.

Solubility.—Soluble in water in every proportion, forming a viscid solution, (mucilage.) One part in six of water, affords a fluid of the consistence of syrup; and in two parts, a medium well calculated for the union of dry powders. It is also soluble in pure alkalies and lime water, as well as in vegetable acids, especially vinegar, with which it forms a mucilage that may be used as a cement, like the watery solution, and possessing the advantage of not being susceptible of mouldiness; it may be kept for years without change. It is insoluble in alcohol, as well as in ether and oils. Alcohol even precipitates it from mucilage; it renders a small quantity of oil or resin, by trituration, miscible with water. Strong acids decompose it. By the action of nitric acid upon it, it forms successively mucic, malic, and oxalic acids: and with chlorine, it forms citric acid. Exposed to heat, it does not melt, but softens, swells, and becomes charred and incinerated. Its products are carbonic acid, carbureted hydrogen gas, empyreumatic oil, and a considerable quantity of acetic acid, combined with a little ammonia.

Medical use.—It possesses the powers of a mucilaginous demulcent in a high degree. It it is useful, 1. In all cases where there seems a natural deficiency of mucus in the intestinal canal, and was, therefore, recommended by Degner, Pringle, and others, dissolved in milk, barley water, &c. to remove tenesmus and painful stools. Zimmerman gave it in glysters, for the same purpose. 2. In cases of acrid poisons, or acrid substances in general, taken into the stomach, to envelop their particles, and mitigate their action. With the same view, it is sometimes given along with acrid medicines. 3. In an irritable state of the respiratory passages, as catarrh, hoarseness and cough, used either in substance as a troche, or in a strong solution, as a linctus, and may be combined with a little opium. 4. In gonorrhœa, and ardor urinæ. 5. In salivation after mercury, &c. 6. In phthisis pulmonalis, both as being supposed by some to check hæmorrhage, and as a light nourishment.

Externally it is applied, 1. In powders to bleeding vessels of a small size, as a styptic, operating by gluing them up. 2. In solution, as an injection, in gonorrhœa, &c.

Dose.—Almost *ad libitum,* in powder or solution, alone or combined with syrups, decoctions, &c.

Adulterations.—Gum Senegal is not unfrequently substituted for it, but this may be distinguished by its clammy and tenacious nature, like the gum produced from the plum or cherry tree; whereas genuine Gum-Arabic, is dry and brittle. In a medicinal point of view, the fraud is of no consequence.

In Salmon's Dispensatory, 1676, *acacia* is said to be the *juice of the unripe fruit* of an Egyptian thorn; and he says it is the true acacia of the ancients; which does not exactly agree with the account of the origin of Gum-Arabic, an exudation from the bark of the same tree.

Celsus, in enumerating medicines for stopping blood, mentions both acacia and gum. *Grieve* in his notes to his translation of the work, says, "that when *gum* is mentioned alone in any of the ancient authors, it is to be understood of Gum-Arabic." Hence there are good grounds for denying the validity of the name here selected by the convention, especially since, as previously noticed, this substance is by no means confined to the acacias.

ACACIÆ CATECHU EXTRACTUM, *L. E.*

CATECHU. *A. D.*

Catechu. The extract of the wood.

Acacia Catechu. L. E. } *Polyg. Monoecia.*
Mimosa Catechu. D. } Nat. ord. *Lomentaceæ.*

THIS tree is a native of Hindostan. The extract of catechu, which was formerly termed, with peculiar impropriety, Japan Earth, is principally prepared in Bengal, from the internal coloured part of

the wood, by decoction, evaporation, and exsiccation in the sun. But catechu is also prepared in India from several other species of acacia, and even from the woods, barks, and fruits of other genera. In Bombay, it is chiefly prepared from the nuts of the Areca catechu. The nuts are taken as they come from the tree, and boiled for some hours in an iron vessel. They are then taken out, and the remaining water is inspissated by continual boiling. The process furnishes the Kassu, or the most astringent terra japonica, which is black, and mixed with paddy husks, and other impurities. After the nuts are dried, they are put into a fresh quantity of water, and boiled again; and this water being inspissated like the former, yields the best or dearest kind of catechu, called Coury. It is yellowish-brown, has an earthy fracture, and is free from the admixture of foreign bodies.

The Bombay catechu is of a uniform texture, and of a red-brown tint, its specific gravity being generally about 1.39. The extract from Bengal is more friable and less consistent. Its colour is like that of chocolate externally; but when broken, its fracture presents streaks of chocolate and of red-brown.—Its specific gravity is about 1.28. Their tastes are precisely similar, being astringent, but leaving in the mouth a sensation of sweetness. They do not deliquesce, or apparently change by exposure to the air, and are not fusible.

Qualities—Of the two varieties above mentioned, are the same, differing only in the degree of austerity and bitter taste.

Chemical composition.—Tannin, rather more than fifty per cent. A peculiar extractive matter, thirty-five per cent. Mucilage, six to eight per cent. Earthy impurities, five to seven per cent.

Solubility.—Almost entirely dissolved both by water and spirit.

Incompatible substances.—Its astringency is destroyed by alkaline salts, and precipitates are produced by metallic salts, especially those of iron.

Medical Uses.—A most powerful astringent in relaxed states of the uvula and fauces, ulcers and aphthæ in the mouth, diarrhœa, &c. It forms an excellent dentifrice with equal parts of bark, and one-fourth of powdered myrrh.

Dose, ten to twenty grains.

ACIDA.—*ACIDS.*

When by combination, any substances acquire a sour taste, the properties of converting vegetable blues to a red; and of saturating, or destroying the characteristic properties of alkalies, earths or metals, they obtain the name of Acids.

Every acid is not, however, possessed of all the above mentioned properties. Some of them form salts, by combining with the alkalies, &c. but have neither a sour taste, nor do they change the vegetable blues to a red. One or more of the properties stated, is to be considered essential to the constitution of an acid.

In general, acids combine with water, in almost any proportion; and with no change of properties, beyond what is dependant on mere dilution.

It is probable, that without the actual presence of water, none of the so called acids, are capable of evincing their peculiar effects.

Some substances have the property of acids induced, by combination with oxygen; others, by combination with hydrogen; and some are capable of undergoing the change, by uniting with either. Those acids formed by the conjunction of hydrogen, are denominated Hydracids.

The opinion that oxygen is not the sole acidifying principle, was first, I believe, maintained by the editor in his Chemical Lectures, in 1810, in the University of Pennsylvania. He, at that time, upheld the equal claim of hydrogen to the same standing. The Lecture was printed in 1811, for the use of his class, and, although the opinion, in those days of confirmed allegiance to the antiphlogistic doctrines, met with opposition and ridicule, it is now received by every chemist in Europe and America. The merit of it, if there be any, has never been ascribed to the editor, except by Professor Gorham, in his Elements of Chemistry: which is the more remarkable, since copies of that essay were sent to the very gentlemen from whom the present doctrine of hydracids is supposed to originate!

Acids have either *simple* or *compound* bases. Those with simple bases are the arsenous, arsenic, boracic, carbonic, iodic, hydriodic, muriatic, nitrous, nitric, phosphorous, phosphoric, sulphurous, sulphuric, hydro-sulphuric.

There are, besides the above mentioned, several more of no use in medicine, and which do not consequently require to be here mentioned.

Acids with *compound* bases are either *ternary* or *quaternary*, that is, embracing three or four principles; they possess the properties of acids in general, but are distinguished from those with simple bases by their great alterability. The ternary acids coincide nearly with the vegetable acids, and are characterized by being converted entirely into water and carbonic acid when completely decomposed by oxygen. They consist of various portions of carbon, hydrogen, and oxygen. To this, however, the Prussic acid, which is a ternary one, is an exception, its principles being carbon, hydrogen, and *nitrogen.*

The *quaternary* acids coincide nearly with the animal acids, and are characterized by furnishing *ammonia*, as well as water and carbonic acid, when decomposed. Hence they contain, in addition, a portion of nitrogen. None of these are employed in medicine. Of the *ternary*, which are numerous, those principally employed in medicine are the acetic, benzoic, citric, gallic, succinic, tartaric.

Some of the acids are *solid;* viz. arsenic and arsenous, benzoic, boracic, camphoric, citric, chromic, gallic, molybdic, oxalic, phosphoric, succinic, tartaric, &c. Some are *fluid;* as the nitric, phosphorous, sulphuric, &c. Some are gaseous; viz. carbonic, nitrous, muriatic, sulphurous, hydro-sulphuric, &c.

The particulars of each acid employed in medicine, will be noticed under their respective heads.

It may be observed here, that the word acid is derived from the Greek ἀκις, ("*acies, acumen: quod acida linguam pungendo vellicent.*" *Blanchard's Lexicon,*) or from οξυς, acidus, from whence, in part, oxygen.

ACETUM.

Acetum. *Vinegar. A. L.*

Acidum Aceticum Impurum. *L. E. Impure Acetic Acid.*

Acetum Vini. *D. White-wine Vinegar.*

Acidum Acetosum. *Acetous Acid.*

This is the first acid of which we have any account. Its appellation in Russian (*Ukzus*) is nearly the same with that in Greek, το οξυς; from whence is derived the name of oxygen, or the supposed acidifying principle of Lavoisier.

This acid is employed in three different states, distinguished from each other by peculiar names. When first prepared by the fermentation of vinous liquors, it is called *vinegar;* when purified by distillation, it assumes the name of *distilled vinegar;* and when concentrated as much as possible, by peculiar processes, it is called *radical vinegar,* or acetic acid. All of these are, however, properly speaking, the same; differing only by varied degrees of dilution, and the presence of some extraneous admixtures. There are, consequently, only one class of salts produced by them, viz. acetats.

Qualities.—These are so well known as not to need description.

Chemical Composition.—Common vinegar consists of acetic acid largely diluted with water; it contains also vegetable gluten, mucilage, sugar, extractive matter, and frequently malic, phosphoric, and tartaric acids, together with small proportions of sulphat of lime, sulphat of potash, and alcohol. Its composition, however, varies according to the fermented liquor from which it is obtained; viz. wine, cider, malt, wood, &c.: thus wine yields a paler, purer, and stronger acid than fermented malt liquors or solutions of sugar; hence it is said the vinegar of France and Italy is superior to that prepared elsewhere. Mr. Chenevix found that English vinegar of 1.0042 specific gravity contained more water and mucilage, but less acid and spiritous liquor than French vinegar of 1.00721. It should be of a pale yellow colour, perfectly transparent, of a pleasant somewhat pungent acid taste, but without any acrimony. It is liable to spontaneous decomposition, or to become mouldy and ropy; and hence, for pharmaceutical purposes, at least for some of them, it requires to be distilled; as, however, the change depends upon the presence of gluten, it may, if boiled, be kept for a much longer time,

especially in bottles, completely filled and well corked. If powdered charcoal be added previously to boiling, it will become quite colourless, like distilled vinegar, and without being impaired in strength, as is the case with that subjected to distillation. It is a curious circumstance, that this is the only vegetable acid, except the Prussic, that rises in distillation in combination with water.

Preparation or Manufacture.—This varies in different countries, from the greater facility of procuring the various articles from which it is prepared.

We can obtain vinegar from wine, beer, cider, &c. It is sufficient for the purpose to expose those liquids to the air.

The following process is pursued at Orleans.—They begin by pouring 100 quarts (litres) of boiling vinegar into an open cask of 400 quarts capacity, placed in a manufactory whose temperature ought to be constantly at 18 or 20° (Cent. = Fahrenheit 65 to 68°); at the end of eight days, ten quarts of wine, whose dregs are deposited, are poured into it; eight days after ten quarts more of wine are added: this is continued every eight days, until the cask is full. Fifteen days after the cask is thus filled, the wine is found to be converted into vinegar; one half of it is poured off, and they recommence the pouring in ten quarts of wine every eight days. If the fermentation is too rapid, which is knowu by the large quantity of foam with which a stick plunged into the cask is covered, more wine is added, and at shorter intervals.

White vinegar is obtained from white wine, or from red wine which has been left to turn sour on the skins of white grapes. Red vinegar is made from red wine: it may be rendered colourless, as Figuier has shown, by filtering it several times through charcoal; when it is muddy, it is cleared with boiling milk; it is only necessary to pour a glassful into twenty-five or thirty quarts of the acid, and to strain the liquid to separate the *coagulum.*

Adulterations.—Sulphuric acid not producing any turbid appearance in vinegar, is usually selected for sharpening its taste. We are not, however, to infer its presence from the mere occurrence of a precipitate by an *acetat of barytes,* (see *acetic acid,*) since the sulphat of lime or of potash, so often present in common vinegar, would, equally with free sulphuric acid, produce with this test, precipitates insoluble in nitric acid. To avoid this fallacy, it must be assayed for sulphuric acid in the following manner. Saturate a given quantity with chalk, add distilled water, and throw the whole upon a filtre; if any sulphuric acid is present, an insoluble sulphat of lime will be formed, recognizable by the usual tests.

Vinegar is made to appear stronger, by infusing in it certain acrid vegetables, as *grains of paradise, berries of spurge flax, capsicum, pellitory of Spain,* &c. These may generally be detected by tasting the vinegar with attention, by which their pungency is perceptible.

Medicinal and other Uses.—Vinegar is much employed in domestic economy, for the purpose of pickling, &c. It would seem that its chief purpose is to abstract the water of vegetation from the ve-

getable matter, and take its place; for the vinegar in which this is first placed, loses so much of its strength, as to be unable to preserve the substance. A fresh quantity is therefore added, after removing the first portion.

In medicine, its action on the system seems to be gently stimulant; it promotes transpiration, and the urinary discharge; probably not more so, however, than an equal amount of aqueous fluid, with which, as a drink, it is always largely diluted. An ounce of vinegar to a quart of water is a good proportion for this purpose. It has been used in scurvy, and to counteract the effects of narcotic poisons, (though incorrectly, according to Orfila,) and mephitic vapours. It has been employed as a glyster in obstinate constipation, and in some diseases. Externally, it is used as a fomentation and bath, and its vapour is inhaled, by means of a funnel, in putrid sore throat, and other complaints of that and the adjacent parts. It is likewise sprinkled in the chambers of the sick, to correct unpleasant smells, &c.

Pyroligneous Acid.

Vinegar is obtained under the name of pyrolignous acid, by decomposing wood in ovens of brick, or in large sheet-iron cylinders. The products of this distillation are charcoal, oil, acetic acid, water, carbureted hydrogen gas, gaseous oxyd of carbon, and carbonic acid.*

The liquid product of this distillation is collected in a wooden reservoir; it consists of water, acetic acid, and a thick oil, resembling, in a certain degree, tar; it is left to itself until the greater part of the oil subsides; it is then poured off and saturated with chalk; an acetat of lime is produced, which remains dissolved, whilst the remaining oily matter comes to the surface and is skimmed off. The liquid containing acetat of lime is mixed with sulphat of soda; the two salts are decomposed, and give rise to an almost insoluble sulphat of lime, which falls to the bottom, and to a soluble acetat of soda; this last is evaporated, and yellow or brownish crystals are obtained, coloured by the oil, from which they may be separated by drying, and causing them to undergo the igneous fusion to destroy the oily matter; then redissolving them in water, and recrystallizing. These crystals, dried and gently heated in a distilling apparatus with concentrated sulphuric acid, are decomposed, and afford pure and concentrated acetic acid; sulphat of soda remains in the retort. The most usual method of obtaining this acid, however, consists in dissolving acetat of soda in a quantity of water, and decomposing it with common sulphuric acid: the sulphat of soda crystallizes, and we can procure the acetic acid by simple distillation.

* For a description of the process as followed by Mr. Mollerat, at Choisi-sur-Seine, see Practical Chemistry, p. 136.

Acetum Purificatum. *A.* *Purified Vinegar.*

Take of

Vinegar, ... one gallon.

Charcoal, fresh burnt and pulverized, . . one ounce.

Mix the charcoal and vinegar; then bring the liquor to a boiling heat, skim, strain through double flannel, and afterwards filter through paper, or suffer the impurities to subside.

It has long been known, from the experiments of Lowitz and others, that charcoal has a powerful agency in destroying the colour of many fluids. It is the case with vinegar, and the fact is adverted to by Dr. Paris in his Pharmacologia, p. 219.

The present formula, as adopted by the National Pharmacopœia, is a very good one; and, if simplifying the Materia Medica is the principal end it had in view, it would appear to be unnecessary to have introduced the preparation of distilled vinegar also, since, as is well known, it is considerably weakened by the process. The vinegar thus purified, may be applied for medicinal use to every purpose that common vinegar is employed for, either internally or externally, and in similar or larger amount.

If we desire to obtain the acid both purer, and also much stronger, it may be subjected to the process of freezing in the winter; the watery parts consolidate as a spongy mass, whilst the acid remains diffused through it; and by breaking down the mass, the acid will drain from the ice, and with a corresponding increase of strength. I have thus obtained from one gallon of good wine vinegar, about two pints of acid, of very great strength, the other three-fourths being the watery parts almost entirely. If this is boiled for a few minutes with charcoal, it loses its colour, and is an acetic acid of great power.

Acetum Distillatum. *A. D.* *Distilled Vinegar.*
Acidum Aceticum tenue. *E.* *Weak Acetic Acid.*
Acidum Aceticum. *L.* *Acetic Acid.*

Take of

Vinegar, ... eight pints.

Distil in glass vessels, on a water bath. Throw away the first pint which comes over, and preserve the next six pints.

Except in the change of a few words, and the use of a *water* instead of a sand-bath, this formula is precisely that of the London College. An omission of some moment is that of not announcing what the specific gravity of the distilled acid should be. It appears to vary in the formulæ of the different colleges from 1004 to 1009.

In its *qualities*, its *odour* is fainter and less agreeable than that of

common vinegar; in *taste*, less acid; and it ought to be colourless and entirely volatile. The reason why the distilled acid is weaker than common vinegar, appears to be, that the water being rather more volatile than the acid, comes over first; hence a considerable portion of concentrated acid is left behind in the retort, in order to prevent the empyreumatic taste which it would acquire if completely distilled over.

The process may be performed either in a common still, or rather in a retort. The better kinds of wine vinegar should be used. Indeed, with the best kind of vinegar, if the distillation be carried on to any great length, it is extremely difficult to avoid empyreuma. The best method of preventing this inconvenience is, if a retort be used, to place the sand but a little way up its sides, and when somewhat more than half the liquor is come over, to pour on the remainder a quantity of fresh vinegar equal to the liquor drawn off. This may be repeated three or four times; the vinegar supplied at each time being previously heated. The addition of cold liquor would not only prolong the operation, but also endanger the breaking of the retort. Lowitz recommends the addition of half an ounce of recently-burnt and powdered charcoal to each pound of vinegar in the still, as the best means of avoiding empyreuma.

If the common still be employed, it should likewise be occasionally supplied with fresh vinegar, in proportion as the acid runs off, and this continued until the process can be conveniently carried no farther. The distilled acid must be rectified by a second distillation in a retort or glass alembic; for although the head and receiver be of glass or stone-ware, the acid will contract a metallic taint from the pewter worm.

The residuum of this process is commonly thrown away as useless, although, if skilfully managed, it may be made to turn to good account, the strongest acid still remaining in it. Mixed with about three times its weight of fine dry sand, and committed to distillation in a retort, with a well regulated fire, it yields an exceedingly strong empyreumatic acid. It is, nevertheless, without any rectification, better for some purposes, as being stronger than the pure acid; particularly for making acetat of potass or soda; for then the empyreumatic oil is burnt out.

Mr. Phillips says, the best malt vinegar has a specific gravity 1.0204; that the first eighth part which it yields on distillation is of specific gravity 0.99712, has a decidedly acid taste, and a fluid-ounce decomposes from 4.5 to 5 grains of precipitated carbonat of lime; whilst the subsequent six-eighths are of specific gravity 1.0023, and a fluid ounce decomposes 8.12 grains of carbonat of lime: hence he concludes that it is improvident to reject the first eighth, since it contains about one-twelfth of the acid obtained, and there is no circumstance rendering it necessary to have distilled vinegar either of very equal or of very great strength.

Chemical Composition of distilled vinegar. Acetic acid more largely diluted than that in vinegar; with minute portions of uncombined mucilage and extractive.

Solvent Powers.—It dissolves all vegetable principles that are soluble in water; and in some cases, as in squills, colchicum, several aromatics and narcotics, its acid appears to extend its solvent powers; at the same time, according to some, it often modifies or *diminishes* the medicinal virtues of the substances, as those of *narcotics;* an opinion not adopted by other writers. When employed, a portion of spirit should be added, in order to obviate the spontaneous decomposition to which it is liable, and the access of the air should be guarded against. I have found that two ounces of pretty strong alcohol were not more than sufficient to prevent the mouldiness, &c. of a pint of acetic solution of opium, (one ounce to the pint,) during the summer season.

Acetic acid has some action on the gum resins; but not on true resins.

Dr. Powell states, (*Transl. of Pharm. of Lond.* 1815,) that one fluidounce ought to dissolve at least thirteen grains of white marble, or, what is equivalent to it, 39.67 grains of crystallized sub-carbonat of soda. Such acid corresponds very nearly with 6° of the British revenue acetometer, the proportions being as follow: 100 grains of Pharmacopœia strength will saturate 8.68 grains of crystallized sub-carbonat of soda; 100 grains of acid of 6° of the acetometer will saturate 8.70 grains of that salt.

Adulterations.—*Sulphuric* acid is detected by a white precipitate being produced, on adding acetat of barytes. *Nitric* acid, by saturating the suspected sample with pure potash, evaporating to dryness, and treating the product with highly concentrated alcohol; the acetat of potash is thereby dissolved, but no action is exerted on the nitrat; it is of course found in the residuum, and may be recognized by deflagrating when thrown on burning charcoal. *Copper* is detected by supersaturating the acid with ammonia, which produces a blue colour; and *lead*, by the dark-coloured precipitate produced by a solution of sulphureted hydrogen. *Tin* is said to be the more usual source of contamination, for no vegetable acid will act upon lead while any tin is present in the mixture; the latter being most oxydable, is exclusively dissolved.

The *pyrolignous* acid, already adverted to, has lately been very generally made to supersede the distilled vinegar in medicine and the arts. It has been so completely separated from all foreign matter, as to afford a perfectly pure acetic acid, invariable in acid powers, and constant in its chemical properties. Such an acid is now prepared by Messrs. Beaufoy and co. of South Lambeth (London), and is sold under the name of *improved distilled vinegar*. It is said to be perfectely free from any unpleasant taste, colour or sediment; and it forms a limpid colourless solution with ammonia. The common distilled vinegar of the shops varies essentially in strength as well as purity; its acid powers differing from thirty to forty per cent. in value; and it is sometimes 7°, at others less than 5° by the revenue acetometer;* and hence the difficulty of

* The acetometer was invented by Messrs. Taylors for this particular purpose: The principle consists in first forming a neutral salt with dry hydrat of lime and the acid to be examined, and then taking the specific gravity of the solution.

procuring an uniform article for medical application. This difficulty seems now obviated, as the pyrolignous acid may be procured of any degree of concentration, from 6° of the acetometer, or 2.898 per cent. of real acetic acid, to 130°, or 63.09 per cent. of acid; and even higher, if required; the common or *proof* acid about equals in strength that of the best malt vinegar, 100 parts of which, will saturate 14½ parts of crystallized sub-carbonat of soda; and consequently contains somewhat less than five per cent of real acid, requiring at least one-half part of water to reduce it to the strength of the best common distilled vinegar. It is found that acetic acid of forty-five per cent. real acid, dissolves camphor and the essential oils very readily.

The British Colleges employ this distilled acid for most of the preparations in which the *acetum purificatum* of the American Pharmacopœia is ordered. Indeed, as to any use made of it in that work, it might have been altogether omitted.

ACIDUM ACETICUM. *D.* *Acetic Acid.*

Acidum Aceticum forte. *E.* *Strong Acetic Acid.*

Concentrated Acetic Acid. *Radical Vinegar.*

Take of

Sulphat of iron dried, . . . one pound.
Acetat of lead, ... ten ounces.

Having rubbed them together, put them into a retort, and distil in a sand bath, with a moderate heat, as long as any acid comes over. (*E.*)

This is one of the easiest processes for the purpose. Many others have been proposed, all of which are reducible to three classes; viz.

1. Decomposing metalline acetats by heat, as verdigris.
2. Decomposing acetats by sulphuric acid, as in the Dublin formula, viz. acetat of potash and sulphuric acid.
3. Decomposing acetats by means of sulphats; as in the formula above introduced from the Edinburgh College.

The difference of the three classes is at once perceived. In the first case, the affinity of the metallic oxyd for the acid is broken up by the agency of heat; but the degree necessary is so great, that a part of the acid itself is generally decomposed, and the product has an unpleasant empyreumatic smell. In the second case, the acetic acid is driven from the base it was united with by the superior affinity of the sulphuric acid. A part of the sulphuric acid, if great care be not taken, is decomposed, and sulphurous acid passes over and contaminates the product. This is a case of single affinity. The third, which is a case of compound affinity, is preferable, in being more economical, and in furnishing a purer acid. The acetat

and sulphat are mutually decomposed; the acetic acid, being volatile, passes over, and is condensed in the receiver; the sulphuric acid combines with the oxyd of lead, and forms a sulphat of lead, which, with the oxyd of iron, are left in the retort.

It is difficult to say why the Colleges have retained a process, the product of which is scarcely employed in medicine, at least in regular practice; although perhaps it might be useful, since its solvent powers are far superior to those of common or distilled vinegar. It is capable of dissolving camphor, resins, and essential oils, copiously, but they are precipitated by dilution.

Acetic acid is a transparent and colourless fluid, of an extremely pungent smell, and a caustic acid taste, capable of reddening and blistering the skin. It is very volatile, and its vapour is highly inflammable; it combines with water in every proportion; it combines with sugar, mucilage, volatile oils, alcohol; it dissolves boracic acid, and absorbs carbonic acid gas; it is formed by the acidification of sugar, and by the decomposition of some other ternary and quaternary compounds by heat or acids. It is decomposed by the sulphuric and nitric acids, and by heat. The proportions of its constituents are not ascertained. In its ordinary state, it has only an acid taste, a pleasant odour; specific gravity, 1.0005; congeals and crystallizes at —22°, and is vaporised at 212°.

It combines with alcohol, and forms a species of ether. Gold, platina, glass, and earthenware, can alone retain this concentrated acid without corrosion.

Medical Use.—It is sometimes used as an analeptic remedy in syncope, asphyxia, hysteric affections, and headache. Applied to the skin, it acts as a stimulant and rubefacient. Common vinegar is, however, more frequently the form in which it is thus employed.

The only *officinal preparation* into which it enters, is the acidum aceticum camphoratum of the Edinburgh College. Vide *Acetica.*

ACETICA. *MEDICATED VINEGARS.*

These are infusions of vegetable substances in acetic acid. The action of the acid in this case may be considered as twofold.

1. It acts simply as water, in consequence of the great quantity of water which enters into its composition, and generally extracts every thing which water is capable of extracting.

2. It exerts its own peculiar action as an acid. In consequence of this, it sometimes increases the solvent power of its watery portion, or dissolves substances which water alone is incapable of dissolving, and in a few instances it impedes the solution of substances which water alone would dissolve.

As acetic acid, in itself sufficiently perishable, has its tendency to decomposition commonly increased by the solution of any vegetable matter in it, it should never be used as a menstruum, unless where

it promotes the solution of the solvend, as in extracting the acrid principle of squills, colchicum, &c. and in dissolving the volatile, and especially the empyreumatic oils, or where it coincides with the virtues of the solvend.

Acidum Aceticum Aromaticum. *E.*

Aromatic Acetic Acid. Aromatic Vinegar.

Take of
Tops of rosemary, dried,
Leaves of sage, dried, ... each four ounces;
Flowers of lavender, dried, . . . two ounces;
Cloves, ... two drachms;
Distilled acetic acid, ... eight pounds.
Macerate for seven days, express the liquor, and filter it. (*E.*)

This is given as an improved preparation of the *Vinaigre des quatre voleurs*, which was supposed to be a certain prophylactic against the contagion of plague, and similar diseases. It is in fact a pleasant solution of essential oils in vinegar, which will have more effect in correcting bad smells than in preventing fever.

Acetum Colchici. *L.*

Vinegar of Colchicum or Meadow Saffron.

Take of
Fresh root of meadow saffron, sliced, . . . one ounce;
Acetic acid, ... one pint;
Proof spirit, ... one fluidounce.
Macerate the root with the vinegar, in a corked glass bottle, for twenty-four hours; then express the liquor, and set it at rest to settle; lastly, add the spirit to the defecated liquor.

This is substituted for the oxymel of the former London Pharmacopœia, and by some is considered to be a more convenient form. It is said to be powerfully diuretic.

The acrid principle, in which the virtue of colchicum resides, seems to be more soluble in vinegar than in water. The diluted alcohol is added to prevent its spoiling. In very warm weather, it is probably scarcely sufficient.

Dose, fluid half-drachm to fl. ʒ 2 in any bland fluid.

Acetum Scillæ. *A. L. D.*

Acidum Aceticum Scilliticum. *E.*

Vinegar of Squills.

Take of
Squills, dried, ... half a pound;
Vinegar, ... three pints;
Proof spirit, ... four ounces.

Macerate the squills in the vinegar for four days, in a glass vessel, frequently agitating it; then express the acid; to which, poured from the fæces after they have subsided, add the spirit. (*D.*)

Vinegar of squills is a medicine of great antiquity. It is a very powerful stimulant; and hence it is frequently used, with great success, as a diuretic and expectorant. The dose of this medicine is from a drachm to half an ounce: where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnamon, or other agreeable aromatic waters, which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

The formula, which the framers of the American Pharmacopœia have adopted, is one which belongs to the Edinburgh College, and may be found in Duncan's Dispensatory, seventh edition, of 1813. Why they should have selected it, is difficult to say; since that college has abandoned it for a stronger preparation. The comparative strength of each may be seen by the following table:

Acetum Scillæ.

	Squill.	Vinegar.	Alcohol.	
London - -	1 lb.	6 lbs.	8 oz.	= 1 ounce to 8 of acid.
Dublin - -	1-2 lb.	3 lbs.	4 oz.	
Edinburgh -	1 oz.	15 oz.	1 1-2 oz.	= 1 ounce to 15 ounces.
America - -	2 oz.	2 1-2 lbs.	3 oz.	= 1 ounce to 20 ounces.

It is to be regretted that the formulæ of different Pharmacopœias should differ so greatly from each other; more especially in medicines, good in themselves, or which serve as the basis of others. It appears very desirable that all our preparations should be made as *strong* as possible. We can always modify the dose to meet existing circumstances; but if originally weak, it demands a proportionate increase in the dose, which, in a remedy so nauseous as the one under notice, it would be well to avoid. I should much prefer the London and Dublin formula, if only for the *coincidence* of the two, independently of its being the strongest.

Acidum Aceticum Camphoratum. *D. E.*

Camphorated Acetic Acid.

Take of
Strong acetic acid, . . . six ounces;
Camphor, ... half an ounce.
Triturate the camphor with a little alcohol; add it to the acid, and dissolve.

The alcohol in this preparation is used merely to facilitate the reduction of the camphor to powder; for the acetic acid is capable of dissolving even a larger portion of camphor than is directed in the above formula.

This solution is a powerful analeptic remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals except gold. It should therefore be kept in glass phials, with ground glass stoppers, or in small gold boxes, such as are used for Henry's aromatic spirit of vinegar, for which it is in fact a simple substitute.

Henry's aromatic vinegar is merely an acetic solution of camphor, oil of cloves, of lavender, and rosemary. A preparation of this kind may be made extemporaneously, by putting one drachm of acetat of potash into a phial with a few drops of some essential oil, and ♏ xx of sulphuric acid. This is a patent nostrum.

ACETUM OPII. *A.*

Vinegar of Opium, or Black Drop.

Take of
Opium, ... half a pound;
Vinegar, ... three pints;
Nutmeg, bruised, . . . one ounce and a half;
Saffron, ... half an ounce.
Boil them to a proper consistence, then add
Sugar, ... four ounces;
Yeast, ... one fluid ounce.
Digest for seven weeks, then place in the open air until it becomes a syrup; lastly, decant, filter, and bottle it up, adding a little sugar to each bottle.

In vol. ix. of the Philosophical Transactions of London, for 1674, p. 147, we have the mode of preparation of laudanum by Van Helmont, in a paper by Robert Boyle (and the same is noticed in his Philosophical Writings, vol. i. 99, and iii. 648.) See also the Abridgment of the same by Dr. Pearson, vol. ii. 155. The prescription is

said to have been given to Boyle by Van Helmont himself. It is highly commended, and seems, indeed, nearly to resemble in preparation the celebrated black drop. It appears there were two kinds of *Helmontian* laudanum, one by the senior, the other by the son: the one here noticed is the latter.

" *Laudanum Helmontii Junioris.*

" Take of opium, one quarter of a pound, and of the juice of quinces four pounds at the least, [for near five pounds would perhaps do better;] the opium being cut into very thin slices, and then as it were minced, to reduce it into smaller parts, is to be put into, and well mixed with the liquor, first made lukewarm, and fermented with a moderate heat for eight or ten days, rather more than less; then filter it, [omitted sometimes by Van Helmont,] and having infused in it, of cinnamon, nutmeg, and cloves, of each one ounce [sometimes Van Helmont used one ounce and a half of each]; let them stand three or four days more; if a full week the better; then filter (or strain through a canvass bag) once more, having let it boil a *walme* [qu ? a little while] or two after the spices are put in. This done, evaporate the superfluous water to the consistence of an extract, or to what other consistence you please. Lastly, incorporate very well with it, two ounces of best saffron reduced to fine powder. [Instead of the powder, Van Helmont sometimes used as much extract as can be obtained from that quantity.]

According to the consistence you desire to have it, you may order it so, as either to make it up into a mass of pills, or keep it in a liquid form; in which case the evaporation must be less, after putting in the saffron.

The dose is five or six to ten drops, according to circumstances; of the pills, somewhat less.

Black Drop.

If we may judge from the writings of William Salmon, 1676, we may well believe that *acetic preparations* of opium had been long celebrated.

Hartmann, in his Tractatus Physico-medicus de Opio, (1615,) preferred it to every other.

The *Anodynum Specificum Paracelsi* seems to have been of the same nature. Salmon gives its formula thus:

" ℞ Theban opium, ... two ounces;
Juice of sour oranges and quinces, . . . ā one ounce and a half;
Cinnamon, cloves, saffron, ... ā one ounce.
Digest with a gentle heat for about an hour, strain, and add
Musk, ... one scruple;
Ambergrease, ... four drachms;
Magistery, or corral, and pearl, ... ā one drachm:
Mix and digest awhile, then add, of
The quintessence of gold, ... one drachm.

" This is the specific anodyne of Paracelsus."

The laudanum of Clossæus was also an acetic preparation of opium.

In Paris's Pharmacologia, p. 469, art. *Opium*, in relation to this article we have the following information:

" The *Black Drop*, or the *Lancaster* or *Quaker's Black Drop.*—This preparation, which has been long known and esteemed, as being more powerful in its operation, and less distressing in its effects, than any tincture of opium, has, until lately, been involved in much obscurity: the papers, however, of the late Edward Walton, of Sunderland, one of the near relations of the original proprietor,* having fallen into the hands of Dr. Armstrong, that gentleman has obliged the profession by publishing the manner in which it is prepared, and is as follows: ' Take half a pound of opium, sliced; three pints of good verjuice, (juice of the wild crab, or the expressed juice of unripe grapes,) and one and a half ounce of nutmegs, and half an ounce of saffron. Boil them to a proper thickness, then add a quarter of a pound of sugar, and two spoonsful of yeast. Set the whole in a warm place near the fire, for six or eight weeks; then place it in the open air until it becomes a syrup. Lastly, decant, filter, and bottle it up, adding a little sugar to each bottle.' One drop of this preparation is considered equal to about three of the tincture of opium. *P. L.* It would appear that an *acetat of morphia* is formed, which is more active and less distressing in its effects, than any other narcotic combination."

" The above ingredients, agreeably to the experiments of a scientific friend, ought to yield, when properly made, about two pints of strained liquor." †

Dr. Paris likewise mentions a preparation very similar to the Black Drop, from the *French Codex*, called *Vinum Opiatum fermentatione paratum*, or *Guttæ, seu Laudanum Abbatis Rousseau*, made with honey in a state of fermentation.

ACONITUM. *ACONITE. A.*

Polyand. Trigynia. Nat. ord. *Multisiliquæ.*

ACONITUM NEOMONTANUM. *D.* ACONITUM NAPELLUS. *L. E.*

Large Blue Wolfsbane. Monkshood. Aconite. The leaves.

The Neomontanum, we are assured by Willdenow, is the species of aconite which has always been used in medicine, although it is almost universally known by the name of Aconitum Napellus in

* Edward Tonstall, a medical practitioner of Bishop's Aukland, in the county of Durham, one of the Society of Friends, about a century ago.

† Thomson's Annals of Philosophy, ii. 232.

consequence of a botanical error of Stoerk, who introduced it into practice.

It is a perennial plant, found in the Alpine forests of Carinthia, Carniola, and other mountainous countries in Germany, and cultivated in our gardens.

The fresh plant and root are very violent poisons, producing remarkable debility, paralysis of the limbs, convulsive motions of the face, bilious vomiting, and cathæresis, vertigo, delirium, asphyxia, death. The fresh leaves have very little smell, but when chewed have an acrid taste, and excite lancinating pains, and swelling of the tongue. By drying, its acrimony is almost entirely destroyed. For medical use, the plant must be gathered before the stem shoots.

Uses and Dose.—When properly administered, it acts as a penetrating stimulus, and generally excites sweat, and sometimes an increased discharge of urine.

On many occasions, it has been found a very effectual remedy in glandular swellings, venereal nodes, anchylosis, spina ventosa, itch, amaurosis, gouty and rheumatic pains, intermittent fevers, and convulsive disorders.

We may begin by giving one or two grains of the dried leaves in powder, but it is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed, and evaporated without any previous clarification, to the consistence of an extract. It is an unfortunate circumstance, that the powers of this medicine vary very much, according to its age and the heat employed in its preparation. When recently prepared, its action is often too violent, and when kept more than a year it becomes totally inert. It may therefore be laid down as an universal rule, in the employment of this and of many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and whenever we have occasion to begin a new parcel of the medicine, we should commence with an inferior dose, and proceed with the same caution as at first.

We may begin by giving half a grain of this extract, either formed into a powder with ten grains of white sugar, or made up with any convenient addition into a pill, twice or thrice a day, and gradually increase the dose: or a tincture of aconite may be prepared by digesting one part of the dried leaves in six parts of spirit of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty and upwards.

A decoction of the roots is said to destroy bugs, and to prove fatal to rats and mice.

ACORUS CALAMUS. *E. L. D.* CALAMUS. *A.*

Sweet Flag. The root.

This plant is perennial, and grows plentifully in rivulets and marshy places about Norwich, and other parts of England, in the canals of Holland, in Switzerland, and in other countries of Europe. It is also abundant in America. The shops have been usually supplied from the Levant with dried roots, which are not superior to those of our own growth.

The root of acorus is full of joints, crooked, somewhat flatted on the sides, internally of a white colour, and loose, spongy texture: its smell is strong; the taste warm, acrid, bitterish, and aromatic; both the smell and taste are improved by exsiccation. This root is generally looked upon as a carminative and stomachic medicine, and as such is sometimes made use of in practice. It is said by some to be superior in aromatic flavour to any other vegetable that is produced in the northern climes of Europe; which is by no means strictly true: it is, nevertheless, a sufficiently elegant aromatic. The fresh root, candied, is said to be employed at Constantinople as a preservative against epidemic diseases. The leaves of this plant have a sweet, fragrant smell, more agreeable, though weaker, than that of the roots.

Neumann obtained by distillation about two scruples of fragrant volatile oil from sixteen ounces of the dried root. It also rose in distillation with water, but not with alcohol. The spirituous extract from two ounces weighed 370 grains, and water extracted from the residuum 190 grains. The watery extract from two ounces weighed 445 grains, and the residuum gave out to alcohol 43.

Chemical Composition.—The principles in which its qualities reside, appear to be essential oil and bitter extractive. The root contains also fecula, which is copiously precipitated by sub-acetat and acetat of lead from its infusion. Watery infusion extracts all its virtues, but decoction impairs them. Spirit is also an appropriate but less efficient solvend.

It may be considered as a mild stomachic, carminative, and tonic; and may perhaps be usefully combined with some of the infusions of vegetables possessing similar powers. It may be given in doses of a cupful of the infusion of one drachm of the dried root to a pint of boiling water, or in powder, from one scruple to one drachm: but the Materia Medica would probably be no ways injured by its omission, as its place may be well supplied by the ginger. The framers of the Pharmacopœia of the United States, have very judiciously consigned it to their secondary list; although it is retained by most of the European Pharmacopœias.

ACTEA SPICATA.

Herb Christopher. Baneberries. The root.

This vegetable is perennial, growing in woods and shady places. It attains the height of about two and a half feet, and flowers in the months of May or June; and produces black, shining, pulpy berries in Autumn, about the size of peas, which are considered as poisonous. On account of its fetid smell, this plant is said to be frequented by toads.

There are two varieties of this plant in the United States; one of which is thus described by the Rev. Dr Cutler: "Christopher baneberries. Blossoms white, berry red. In woodland and shady places.—May. The berries are exceedingly poisonous. Dr. Withering says, the plant is powerfully repellent; and that the root is useful in some nervous cases, but it must be administered with caution." Actea racemosa, (says Dr. Mease, Dom. Encyclop.) black snake root, or rich weed, is a very beautiful plant when in flower. The utility of the root of this plant is well known. It is an astringent; and Dr. Barton says, it was used in the form of decoction as a gargle, with success, in a putrid sore throat, which prevailed in New-Jersey, many years ago. A decoction of the root cures the itch. In North-Carolina, it has been useful as a drench in the disease of cattle, called the murrain.

ADEPS.

FAT, GREASE, TALLOW.

Except in consistency, there appears to be no very considerable difference, in a medical point of view, between the different kinds of animal oils, or fats. They are known under different names, and are individually employed in different places, more probably from the facility of obtaining them, than from any actual superiority, the one above the other. The greater consistency of some than of others, makes a change of proportion necessary sometimes, in winter and summer, for the preparation of ointments, &c., to the formation of which, all these animal oils may be considered as chiefly devoted.—*Vide Unguenta.*

Adeps Anseris.—Goose Grease, from roasted geese; esteemed by many as highly emollient, and used occasionally in glysters.

Adeps Hominis.—Human fat, said to be the most emollient of fats, and still used in the Russian hospitals.

Adeps vel *Pinguedo Ursi.*—Bear's Grease.

ADEPS. *A.*

ADEPS SUILLUS PRÆPARATUS. *D.* ADEPS PRÆPARATA. *L.*

ADEPS SUI SCROFÆ.—*vulgo Axungia Porcina. E.*

Prepared Hog's Lard, fat.—Axunge. Ab unguendo plaustri axe. (Plin.) from being used as the grease of wheels.

THIS is obtained like the other animal fats, from the raw lard, by chopping it fine, or rolling it out, in order to break the cells in which the fat is lodged, and then melting it in a water bath, or other gentle heat, and straining it whilst warm.

Qualities.—Consistence, soft, or nearly semi-fluid. *Odour* and *taste*, none, if pure; it melts at 97°.

Chemical composition—It appears, like other fats, to consist of two distinct bodies existing together in a state of mechanical mixture, viz *stearin* (from στεαρ tallow) which is white, brittle, and somewhat resembling wax; and *elain*, (from ελαιον, oil,) very similar in appearance to vegetable oil, and liquid at 59°. According to Braconnot's experiments. the proportion of elain to that of stearin, in hog's lard, is as 62 to 38. For the method of procuring these substances, see Practical Chemistry, p. 138.

Solubility.—Insoluble in water and alcohol, but unites with alkalies, and forms soaps.

Table of Solubility of Fats in 100 *parts of alcohol and sulphuric ether. By P. F. G. Boullay.*

	Alcohol, sp. gr. 0.828. 48 Fahr.	Alcohol, sp. gr. 0.828. 74 boiling.	Ether. 48 Fahr.
Hog's lard	1.04	1.74	25
Mutton suet	0.69	1.39	10
Spermaceti	1.39	8.33	20

Proportion of Oils and Suet in various Fats, according to Braconnot.

	Oil.	Suet.
Melted butter, summer	60	40
winter	35	65
Hog's lard	62	38
Beef marrow	24	76
Mutton marrow	74	26
Goose grease	72	32
Turkey grease	74	26
Olive oil	72	28
Oil of almonds	76	24
—— colsa	54	46

Incompatible substances.—Extracts, spirituous preparations, tinctures, and infusions, are incapable of perfect union with lard, without some intermedium; the following substances, on the contrary, are capable of intimately combining with it, viz. all *dry powders*, whether vegetable or mineral; *fixed* and *volatile oils, balsams, camphor, soaps.*

Adeps Ovillus. *E.* Sevum. *A. L. D.* *Mutton Suet.*

This, as being firmer than the preceding, is employed, when greater consistency in ointments, &c. is required. It is the stiffest, and least fusible of the officinal fats.

Adeps Bovis vel *Sevum bovinum.* *Beef Suet, or Tallow.*

It possesses no properties different from the preceding; either may be employed indiscriminately.

Adeps Cetaceus. Spermaceti.

Sperma Ceti. *A. E. D.* Cetaceum. *L.* *Spermaceti.*

The spermaceti whale is characterized by his enormous head, great part of which is occupied by a triangular cavity of bone covered only by the common integuments. In the living animal this cavity is filled with a white, fluid, oily substance, amounting sometimes to many tons in weight. On the death of the whale, it congeals into a white unctuous mass, from which a considerable quantity of very pure whale oil is obtained by expression. The residuum, afterwards freed from impurities, by washing with water, melting, straining, expression through linen bags, and, lastly, washing in a weak ley of potass, is the peculiar substance well known by the name of spermaceti. It is also contained in solution, in the common whale and other fish oils; for it is often found deposited, by a species of crystallization, in the reservoirs containing them.

Spermaceti may be obtained crystallized in white argentine plates, of an unctuous feel and taste, and a vapid smell. It melts between 90° and 95°, and at a higher temperature may be sublimed almost unchanged. Its vapour is inflammable, and its flame is bright, clear, and without smell. By exposure to air it becomes rancid. It is soluble, especially by the assistance of heat, in alcohol and in ether. In its other properties it agrees with the fixed oils, with which it unites very readily by fusion. Muscular flesh by long maceration in water is converted into a substance very analogous to spermaceti, but more fusible, melting at 82°; and biliary calculi often consist of another, which is much less fusible, requiring a heat of 192° for its fusion. For all these varieties, Fourcroy has proposed the generic name *Adipocere.*

As a medicine, for internal use, it agrees with the fixed vegetable oils; and in the composition of ointments, &c. its place may be very well supplied by a mixture of oil and wax.

It may be proper here, cursorily to notice the *sebacic acid,* or acid of fat, which, although it does not enter into the Materia Medica, must, doubtless, by its presence at times, influence the properties of many preparations, into which fat or tallow enter. It is probable it may tend to induce rancidity, if not itself a product of this pecu-

liar change; and it is not impossible, that to its presence, may be owing the greater facility with which rancid fat, or old ointment, are enabled to kill quicksilver.

Sebacic acid has no smell, and a slightly acid taste. It is crystallizable, melts like fat, and is not volatile. It is so soluble in hot water, as to become solid on refrigeration. It is also very soluble in alcohol. It precipitates the nitrats of lead, silver, and mercury, and the acetats of lead and mercury. It does not precipitate the waters of lime, baryta, or strontia.

This acid may be formed according to Plenck, (*Hygrologia, p.* 236, *Lond.* 1797,) by exposing tallow to a gentle heat, in a frying-pan, and mixed with one third of quick lime. By continued agitation, a sebacic calx is formed. Boil this calx in twelve parts of water, filter, evaporate to dryness, and calcine the salt; distil with half the amount of sulphuric acid; a sulphat of lime remains, and pure sebacic acid passes into the receiver.

See also, Practical Chemistry, p. 174.

Æsculus Hippocastanum. *D.*

Horse Chesnut. The bark.

This is a common and well-known tree. The fruit, which contains much amylaceous matter,* has been used as food for domestic animals, and even for men, in times of scarcity. But its introduction into the Pharmacopœias, was probably owing to its having been used and recommended as a sternutatory in some cases of ophthalmia and headach. With this view it was drawn up the nostrils in the form of an infusion or decoction.

The bark has been proposed as a substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhus fever, and also when applied externally in gangrene, sufficiently warrant future trials. Although chemical analysis is not yet sufficiently advanced to enable us to determine from it the medical uses of any substance, it appears that the active constituent of this bark is tannin, which is incompatible with the presence of Cinchonin, the predominant, and probably the active constituent of Peruvian bark. In powder it may be given to the extent of a scruple and a half, or a drachm for a dose. Buchholz prefers a solution of a drachm of the extract in an ounce of cinnamon water, of which sixty drops are to be given every three hours.

* Professor Woodhouse obtained from a single nut of the Æsculus Pavia, weighing half an ounce and twenty-five grains, forty-four grains of fine starch. Half a pound of this starch, preserved its colour unimpaired two years. The doctor thought it superior to the finest Polish starch. The water of the first washing, used to receive the grated nuts, was found to hold a poisonous matter in solution. See Med. Repos. vol. 3. p. 211.

AGRIMONIA EUPATORIA. *D.*

Agrimony. The herb.

This plant is arranged in the Edinburgh New Dispensatory in the class *Dodecandria Digynia.*—Mr. Nuttall classes it in *Icosandria.* It is a native of the United States.

It is said the Indians used an infusion of the roots in inflammatory fevers with great success; and, according to Kalm, the Canadians have great confidence in it for the same purpose. The leaves of this vegetable are said to be aperient, detergent, and to strengthen the tone of the viscera; hence they have been used in laxity of the intestines, in scorbutic, and other disorders arising from debility. Digested in whey, agrimony affords a diet-drink grateful to the palate and stomach, and was formerly supposed to be an effectual remedy for the jaundice.

The leaves and stalks, together with the closed flowers, afford a dark yellow decoction, which when previously impregnated with a diluted solution of bismuth, imparts a beautiful and permanent gold-colour to animal wool.

The herb, when fresh, has a pleasant smell, which however is lost on drying. Its taste is then bitterish and astringent. Lewis got from it an oil of a yellow colour.

ALCOHOL. *ALCOHOL. A.*

ALCOHOL FORTIUS. *E.* SPIRITUS RECTIFICATUS. *L.*

SPIRITUS VINOSUS RECTIFICATUS. *D.*

Alcohol. Rectified Spirit of Wine.

The specific gravity, according to the London, Edinburgh and United States' Pharmacopœias, to that of water, should be .835, that of Dublin orders it at .840. The *pure* alcohol, which is directed to be prepared by the London and Dublin Colleges from the article under consideration, will be presently adverted to.

Alcohol is a term of Arabian origin, and implies the purer part of a substance, separated from its impurities.

The Edinburgh and United States' Pharmacopœias have no process for the preparation of alcohol; but they have most incorrectly assigned the title to a substance which is the rectified spirit of the other colleges. This is peculiarly reprehensible in that of the United States, which professes its nomenclature "to be conformable to the present language of science," and ought to receive immediate attention.

In the preparation under notice, alcohol is in as high a state of concentration as it can readily be prepared in the large way for the

purposes of trade. That of .835 specific gravity, at 60° *Fahr.* consists of 85 per cent. of pure alcohol and 15 of water. The other of .840 has only 83 per cent. of real alcohol.

The various degrees of strength of ardent spirits is technically denominated by numbers, referring to an arbitrary strength, called in the English laws, *proof spirit;* a gallon of which weighs seven pounds, eleven ounces and three drachms avoirdupois. When spirit is said to be one to three over proof, it is meant, that one gallon of water added to three gallons of the spirit, will reduce it to proof: on the contrary, one in three under proof, signifies, that in three gallons of that spirit, there is contained one gallon of water, and the remaining two are proof spirit. By the same authority, a gallon of water weighs eight pounds, seven ounces and five drachms avoirdupois, so that the specific gravity of proof spirit is to that of water, as 910 to 1000.

The spirit distilled from the wash or vinous liquor, until a glass of it, thrown upon the still head, does not take fire by a candle, is called *low wines,* and this being again distilled, is called spirit.

Alcohol is the characteristic principle of vinous liquors. It arises from the decomposition of sugar by fermentation, and is found in greatest quantity in the wines of warm countries, prepared from thoroughly ripened fruit. In the south of France, some wines yield a third of brandy. It is the proportion of alcohol which renders wines more or less generous, and prevents them from becoming sour. The richer a wine is in alcohol, the less malic acid it contains, and therefore, the best wines give the best brandy, because they are free from the disagreeable taste which the malic acid imparts to them. Old wines give better brandy than new wines, but less of it.

Alcohol is procured from wine by distillation; in conducting which, the following rules are to be observed:

1. To heat the whole mass of fluid at once, and equally.
2. To remove all obstacles to the ascent of the vapour.
3. To condense the vapour as quickly as possible.

The distillation is continued until the liquor which comes over is not inflammable.

Beaumé mentions a very remarkable fact concerning the preparation of alcohol. He distilled two pounds of alcohol, sp. gr. 832, in the water bath, and filled the refrigeratory with ice, and he obtained two pounds four ounces of an alcohol having only sp. gr. 862. This he ascribes to water condensed from the air in the worm by the coldness of the ice, and he assures us from experience, that to get an alcohol of 827, it is absolutely necessary that the refrigeratory be filled with water of 145° F.

Distillers judge of the strength of their spirits by the size and durability of the bubbles it forms, when poured from one vessel into another, or in agitating it in a vessel partly filled. Another proof is, by the combustion of gunpowder: some of which is put in a spoon; it is then covered with the spirit to be tried, which is set on fire; if it kindle the gunpowder, it is supposed to be strong, and *vice versa.* But a small quantity of spirits will always kindle gunpowder, and a

large quantity never. Another proof is, by the carbonat of potass, which attracts the water, and dissolves in it, while the alcohol swims above. But all these are uncertain; and dependence can only be put in the proof by hydrometers, or some such contrivance, for ascertaining the weight of a given quantity at a given temperature.

Different materials are employed in different countries to undergo the vinous fermentation, as the previous step to distillation, in order to separate the alcoholic parts thereby produced; thus, in France, Spain, &c. wine from the juice of the grape is distilled for the purpose affording the well known liquor brandy; called also Eau de Vie, Aqua Vitæ, and Spiritus Vini Gallicus. Some wines yield nearly one-third, and others less than one-eighth of brandy.

Malt Spirit is made from barley and other grains infused in water, and suffered to ferment. When it is in a fit state, it is subjected to distillation.

Rum—from the refuse of the raw sugar manufactories, mixed with molasses; or from the juice of the sugar cane.

Arrack—from the juice of the palm tree in Batavia, and from rice or millet in China.

Koumiss—from mare's milk, by the Tartars, and a similar spirit, though weaker, has been obtained from the milk of the cow.

Cider, *Beer*, and all other fermented liquors, are more or less proper for its extraction.*

ALCOHOL DILUTUM. *A.*

Alcohol Dilutius. *E.* Spiritus Vinosus Tenuior. *D.*

Spiritus Tenuior. *L.*

Diluted Alcohol. Spirit of Wine. Proof Spirit.

This is a rectified spirit, diluted with a certain proportion of water. The specific gravity of the diluted alcohol of the London and Dublin colleges is 930, that of Edinburgh .935. Our own Pharmacopœia is silent on this head, although they give a formula for its preparation.

The diluted alcohol of the two first named colleges above, consists of forty-four per cent. of pure alcohol, and may be formed by mixing *four* parts by measure of rectified spirit, with *three* of water; the other, in which our own coincides, contains only forty-two per cent. of pure alcohol, and is made by mixing *equal* parts of rectified spirit and (distilled) water. In this state of dilution, alcohol is better adapted for taking up the principles of vegetables than rectified spirit. It acts upon bodies as a chemical compound, and will dissolve what neither of the ingredients would, if separately applied. Hence the necessity of uniformity of strength in the spirits we employ. Most of the spirit employed by Apothecaries is unfit for the purposes of pharmacy, being too often whiskey or some imperfect material,

* For some particular details on the subject of distilling spirits, consult Practical Chemistry, p. 148.

usually contaminated with some empyreumatic oil, which communicates a disagreeable flavor to the medicines. It is therefore correctly ordered by all the colleges, that rectified spirit, and the same diluted, should alone be used for the preparation of tinctures, &c.

If common water be employed for diluting alcohol, the resulting spirit will be turbid, owing principally to the precipitation of sulphuric salts. Dr. Paris states a curious fact noticed at the laboratory of the Royal Institution, viz: that diluted spirit *becomes stronger* by being kept in vessels that are carefully closed by bladder! Whence it would seem, he adds, that alcoholic vapour transpires through this animal membrane less freely than aqueous vapour, and which he thinks is probably connected with the different solvent powers of these two liquids, in relation to the animal membrane.

This diluted alcohol is employed in the preparation of all the tinctures and distilled spirits, which are not expressly directed by the colleges to be prepared with alcohol. (Spiritus Vini Rectificatus.) This later is the article used in the preparation of pure alcohol and of ether, &c.

The following table exhibits the specific gravity of various mixtures of alcohol and water, &c.

Table of the Specific Gravities according to Gilpin, and degrees according to Beaumé's hydrometer, and in Clark's hydrometer, which is used in the revenue (Great Britain,) of various mixtures of alcohol and water.

Water.	Alcohol.	Specific Gravities. 60°	Specific Gravities. 55°	Degrees. 55°	Sp. Gr. 60°	Clark's Hydrom.
0	100	.825	.82736	38	833	Spirit of Wine.
10	100	.84568	.84802	34+	858	1 to 2
20	100	.86208	.86441	30—	881	3
30	100	.87569	.87796	29+	891	4
40	100	.88720	.88945	27+	896	5
50	100	.89707	.89933	25+	900	6
60	100	.90549	.90768	23—	904	7
70	100	.91287	.91502	22	907	8
80	100	.91933	.92145	21—	909	9
90	100	.92499	.92707	20—	910	10
100	100	.93002	.93208	19—	913	15
100	90	.93493	.93696	19+	916	20
100	80	.94018	.94213	18	920	Proof Spirit.
100	70	.94579	.94767	17—	926	1 in 20
100	60	.95181	.95357	16—	928	15
100	50	.95804	.95966	16+	932	10
100	40	.96437	.96575	15+	933	9
100	30	.97074	.97181	14+	934	8
100	20	.97771	.97847	13+	936	7
100	10	.98654	.98702	12+	938	6
100	0	.1		10	942	5
					945	4
					954	3
					964	2

Alcohol. *Alcohol. L. D.*

Take of
- Rectified spirit of wine, ... one gallon;
- Pearl-ashes, dried at 300° Fahr., and still warm, . one pound;
- Caustic kali, in powder, ... one ounce;
- Muriat of lime, dried, ... half a pound.

Mix the spirit and kali; add the pearl-ashes, previously reduced to powder, and digest the mixture for three days in a close vessel, frequently agitating it; then pour off the spirit, mix with it the muriat of lime, and distil with a moderate heat, until the residuum begins to grow thick. (D.)

Specific gravity 820. *D.*
Specific gravity 815. *L.*

The muriat of lime is readily obtained from the residuum left in the preparation of water of caustic ammonia.

When any ardent spirit is redistilled to produce alcohol, the water bath is commonly used, which gives a more equal and temperate heat, and improves the product. Gren says, that the addition of four pounds of well burnt charcoal, and three or four ounces of sulphuric acid, previous to this rectification, destroys entirely the peculiar taste of malt spirit; and that a second rectification with one pound of charcoal, and two ounces of sulphuric acid, affords an alcohol of very great purity.* But the affinity of alcohol for water is so very strong, that it cannot be obtained entirely free from it by simple distillation. We must, therefore, abstract the water by means of some substance which has a stronger affinity for it than alcohol has. Carbonat of potass was formerly employed; but muriat of lime is preferable, because its affinity for water is not only very great, but by being soluble in alcohol, it comes in contact with every particle of the fluid. For this purpose, one part of muriat of lime, rendered perfectly dry by having been exposed to a red heat, and powdered after it becomes cold, is put into the still. Over this, three parts of highly rectified spirits are to be poured, and the mixture well agitated. By distillation with a very gentle heat, about two-thirds of the spirit will be obtained in a state of perfectly pure alcohol.

The chemical properties of alcohol are as follow.

Alcohol is a transparent colourless liquid, of an agreeable penetrating smell, and pungent burning taste: specific gravity 0.8. It remains fluid in the greatest natural or artificial cold. It boils at 176°, and in vacuo at 56°. Alcohol unites with water in every proportion. During the combination, caloric is evolved, and the specific gravity of the compound is greater than the mean of those of the components. Alcohol dissolves about 60 of sulphur, when they are presented to each other in the state of vapour. It also dissolves a

* Although this is an old established fact in Europe, yet a patent has been obtained in the United States for the same employment of charcoal!!

little phosphorus. These solutions are decomposed by water. It dissolves the boracic and carbonic acids, ammonia, soda, and potass, and is the means employed to obtain the two last in a state of purity. Its action on the salts is various. It dissolves the volatile oils, resins, soaps, balsams, camphor, sugar, tannin, extractive, and in part, the gummy resins. Alcohol is very inflammable, and when kindled it burns entirely away with a blue flame without smoke. The products of this combustion are carbonic acid and water. It is also decomposed by being transmitted in the state of vapour through a red-hot porcelain tube; by being heated with the fixed alkalies; and by the action of the sulphuric, nitric, oxy-muriatic and acetic acids.

Chemical Composition.—In a state of purity, alcohol consists of carbon, hydrogen, and oxygen, in proportions not yet accurately determined. The preparation here described, contains seven per cent. of water. Lovitz and Saussure succeeded in obtaining it of specific gravity .791, which is nearly pure.

Medical uses.—Which ever of the ardent liquors are employed, they are to be regarded as diluted alcohol, although each possesses a peculiarity of operation, owing to the modifying influence of the other elementary ingredients, &c. On the living body alcohol acts as a most violent stimulus. It coagulates all the albuminous and gelatinous fluids, and corrugates all the solids. Applied externally, it strengthens the vessels, and thus may restrain passive hæmorrhagies. It instantly contracts the extremities of the nerves it touches, and deprives them of sense and motion; by this means easing them of pain, but at the same time destroying their use. Hence employing spirituous liquors in fomentations, notwithstanding the specious titles of vivifying, heating, restoring mobility, resolving, dissipating, and the like, usually attributed to them, may sometimes be attended with unhappy consequences. These liquors received undiluted into the stomach, produce the same effects, contracting all the solid parts which they touch, and destroying, at least for a time, their use and office: if the quantity be considerable, a palsy or apoplexy follows, which ends in death. Taken in small quantity, and duly diluted, they act as a cordial and tonic: if farther continued, the senses are disordered, voluntary motion destroyed, and at length the same inconveniences brought on as before. Vinous spirits, therefore, in small doses, and properly diluted, may be applied to useful purposes in the cure of diseases; whilst in large ones they produce the most deleterious effects.

ÆTHEREA.

Æther Sulphuricus. *Sulphuric Ether. A. E. L. D.*

Sulphuric Ether. Vitriolic Ether.

As the formula of the United States' Pharmacopœia, is an *imperfect* copy of that of London, we do not think it proper to give so incorrect a plan for obtaining one of the most important articles of the materia medica.

Æther Sulphuricus. *Sulphuric Ether. L.*

Take of
Rectified spirit,
Sulphuric acid, of each . . . . . . one pound and a half.

Put the spirit into a glass retort, and gradually add to it the acid, shaking them frequently, and taking care that the temperature, during the mixture, do not exceed 120° Fahr.

Then cautiously place the retort in a sand-bath, previously heated to 200°, so that the liquor may boil as quickly as possible, and the *ether* may be distilled over into a tubulated receiver, to which a vessel cooled with ice or snow is fitted. Continue the distillation, until a heavier fluid begin to come over, which is seen in the bottom of the receiver, below the ether.

Pour twelve ounces more of rectified spirit upon the liquor remaining in the retort, and repeat the distillation of ether in the same manner.

We have not, however, as yet, by the preceding process, obtained *ether* fitted for medical use. Powell himself tells us, it is "impregnated with some sulphurous acid, as is evident to the smell, and with some ethereal oil; and *these require a second process,* or rectification, to separate them." It contains, likewise, a large amount of alcohol. To remove these, that process is recommended by all the colleges, which is called *rectification,* and is as follows, after the same college, from which the preceding formula is selected.

Æther Rectificatus. *Rectified Ether. L.*

Take of
Sulphuric ether, ... fourteen fluid ounces;
Fused potass, ... half an ounce;
Distilled water, ... two fluid ounces;

Dissolve the potass first in the water, and add the ether to it, shaking them constantly, until they are mixed. Lastly, with a heat of about 120°, distil from a large retort into a cold receiver, twelve fluid ounces of rectified ether.

Qualities—Ether is a colourless liquid, of specific gravity (.739, Dr. Paris) .765, Dublin; .758, Edinburgh Dispensatory. It has been obtained, by Lovitz, of only .632 specific gravity.

Odour.—Pungent and fragrant. It is highly volatile, and when properly freed from alcohol, it boils at 98°; its extreme inflammability, is a circumstance which should be remembered, when it is poured out by candle light.

Chemical Composition.—Like alcohol, it consists of oxygen, hydrogen, and carbon. It is difficult to comprehend precisely the circumstances of the difference of these two fluids, their principles being the same. I think the explanation given by Thenard is one of the simplest, and may sufficiently elucidate the changes that ensue, when sulphuric acid is made to act upon alcohol. According to Thenard, there are two kinds or genera of ether, viz. 1st genus comprises only *one* ether, composed of hydrogen, carbon, and oxygen, and containing not a particle of acid; such is the case with sulphuric, phosphoric, arsenic, and fluoric ether, since it can be procured with either of them. 2dly, Ethers of the second genus, are nine in number, viz. hydrochloric, nitrous, hydriodic, acetic, benzoic, oxalic, citric, tartaric, and gallic, and are regarded as consisting of alcohol and acid, in which the acid is more or less neutralized by the alcohol; or they may be considered as formed of the constituent principles of the one or other of these bodies.

Sulphuric ether, it is added, is the result of the action of concentrated sulphuric acid on alcohol, at a boiling heat. Analysis shows, that the elements of alcohol may be represented by

Two volumes of olefiant gas, (percarbureted hydrogen,)
Two do. of the vapour of water, (oxygen and hydrogen,)
Th. de Saussure.

and the elements of ether, according to Gay Lussac, may be represented by

Two volumes of olefiant gas,
One do of vapour of water, (oxygen and hydrogen,)

from whence it follows, that to convert alcohol into ether, we must merely remove *the half* of the water it contains, or, at least, of its elements, oxygen and hydrogen, in the proportion in which they form water; it is therefore evident, that when alcohol and sulphuric acid are made to act on each other, this last, possessing a great affinity for water, determines its formation at the expense of the oxygen and hydrogen of the alcohol, which by this is transformed into ether.—Vide Practical Chemistry, p. 151.

Be this theory correct or not, it is the most simple I have met with, of the formation of ether; and any one interested in the consideration, will do well to consult the whole view of the subject as detailed in the work adverted to. The superiority of the plan there proposed by Mr. Boullay, is conspicuous; since that gentleman, it is affirmed, etherified twenty pounds of alcohol, with twelve of acid; whilst by the old process, we only etherify an equal weight to the acid employed.

After detailing the processes for the other ethereal preparations,

we shall introduce the observations of the Edinburgh Dispensatory, which are well deserving of attention.

Rectified ether, is one of the most powerful solvents known in vegetable chemistry, as it dissolves balsams, resins, gum resins, wax, camphor, extractive, &c. It takes up about one-twentieth its weight of sulphur, but exerts no solvent power upon the fixed alkalies.

It may be given internally, in any liquid vehicle, in doses of from twenty drops, to two fluid drachms, and is highly valuable as a diffusible stimulant, narcotic, and antispasmodic. In order to produce its full effects, the remedy requires to be repeated at short intervals. In catarrhal and asthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of sugar on which ether has been dropt. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodic, in hysteria, and in other spasmodic, and painful diseases; and as a stimulus in soporose and apoplectic affections. Regular practitioners seldom give so much as half an ounce, much more frequently only a few drops, for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head or teeth. On the contrary, if it be dropt on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part to which it is applied, in this way it has frequently facilitated the reduction of strangulated hernia.

Ether, according to Dr. Reid, produces decided sedative effects on the spinal system, as he convinced himself, by giving it in the form of enema, to a patient who had not been able to swallow for two days, in consequence of tetanus. "In a few minutes the patient said he felt a warm glow within, the spasm totally relaxed, and he sat up and eat a bowl of jelly."—Med. Intellig. vol. ii. p. 214.

Adulterations and Impurities.—Its specific gravity affords the best indication of its purity. *Sulphuric acid* may be detected by a precipitation, on adding a solution of barytes, and by its reddening the colour of litmus. *Alcohol*, by its forming with phosphorus, a milky, instead of a limpid solution. When long kept without disturbance, Gay Lussac has observed, that it undergoes spontaneous decomposition; and that acetic acid, perhaps some alcohol, and a particular oil, are produced from it.

SPIRITUS ÆTHERIS SULPHURICI. *A. L.*

Æther Sulphuricus cum Alcohole. *E.*

Sulphuric Ether with Alcohol.

Liquor Æthereus Sulphuricus. *D. Sulphuric Ethereal Liquor.*

Sweet Spirit of Vitriol.

Take of
Sulphuric ether, . . . half a pint;
Alcohol, ... one pint;
Mix them.

The ether of the United States' Pharmacopœia, is, in every essential particular, the same as this. Indeed, the Dublin college direct this preparation under the name of *Sulphuric Ethereal Liquor*, as preparatory to the production of pure ether, by rectification. It is obvious, therefore, that the preparation of sweet spirit of vitriol, by our Pharmacopœia, is by no means the same with the article of other Pharmacopœias; but a mixture of sweet spirit of vitriol itself, with a double portion of alcohol.

How far it will answer the intentions of its framers, I shall not pretend to determine. The medicine *intended*, has all the properties of ether, but in an inferior degree. Its dose is one to three fluid drachms.

OLEUM ÆTHEREUM. *A. L. Ethereal Oil.*

Oleum Vini. *Oil of Wine.*

After the distillation of sulphuric ether, continue the process with a reduced heat, until a black froth swell up. Immediately remove the retort from the fire, and pour water (warm) upon the liquor in the retort. Skim off the oily matter, which swims upon the water, and mix with it as much lime water as will saturate the acid in it. Shake them together; and collect the ethereal oil after it has separated.

This is not employed alone in medicine, but is used to assist in the preparation of the following article.

SPIRITUS ÆTHERIS SULPHURICI COMPOSITUS. *A. L.*

Compound Spirit of Sulphuric Ether.

LIQUOR ÆTHEREUS OLEOSUS. *L.* *Oily Ethereal Liquor.*

Hoffman's Anodyne Liquor.

Take of
Spirit of sulphuric ether, . . . one pint;
Ethereal oil, ... two fluid drachms;
Mix them. *L.*

This preparation is intended as a substitute for the *liquor anodynus mineralis* of Hoffman, although its composition was never revealed by him. Dr. Powell, in his translation of the London Pharmacopœia, p. 263, 1809, refers to " Obs. Phys. Chem. lib. ii. *Dissert. de acido vitriol. vinos. Med. Rat. Syst. v. iii.*" I have not been able to find any part of Hoffman's works in which it is particularly specified. It is supposed by many practitioners, to possess an anodyne property, and to allay irritation more effectually than any other preparation of ether.

Its dose is from half a drachm to two drachms.

The following observations on ether, are deserving of attention.

The products arising from the decomposition of alcohol by the action of the acids are extremely curious and interesting. The theory of their formation was not understood until lately, when it was very ingeniously attempted by Fourcroy and Vauquelin, who endeavour to show that the acid remains unchanged, and that the alcohol is converted into ether, water, and charcoal.

The most convenient way of mixing the ingredients, is to put the alcohol into a tubulated retort, and with a long-tubed funnel reaching down to the bottom of the retort, to pour in the acid. By cautious agitation the two fluids unite, and heat is produced, which may be taken advantage of in the distillation, if we have a sand bath previously heated to the same degree, to set the retort into immediately after the mixture is completed; nor is there any occasion for a tubulated receiver, if we immerse the ordinary receiver, which ought to be large, in water, or bury it in broken ice.

The distillation should be performed with an equal and very gentle but quick heat; but Mr. Phillips says erroneously, for when the distillation of ten ounces of product was completed in three hours, its specific gravity was 0.791; but when it occupied almost nine hours, it was only 0.782. The juncture of the retort and recipient is to be luted with a paste made of linseed meal, and further secured by a piece of wet bladder.

Immediately on mixing the acid with the alcohol, there is a considerable increase of temperature, and a slight disengagement of alcohol, somewhat altered, and having an aromatic odour. On placing

the retort in the sand bath, a portion of pure alcohol first comes over; and when the mixture in the retort boils, the ether rises, and is condensed in thin, broad, straight streaks, having the appearance of oil. Until the liquor which passes over into the receiver amounts to about half, or somewhat more than half, of the alcohol operated on, it consists almost entirely of alcohol and ether, and there has been no production of any permanently elastic fluid; but now the product of ether ceases; the sulphuric acid is decomposed; and sulphurous vapours begin to arise, which condense in irregular streaks, or in drops: we must therefore either put a stop to the process, or change the receiver. In the latter case the products are, sulphurous acid, acetic acid, water, and oil of wine, as it was called, accompanied towards the end by a peculiar species of carbureted hydrogen gas, called by the Dutch chemists Olefiant gas; because, when mixed with oxygenized muriatic acid, it forms oil. At last the matter in the retort, which has now become thick and black, swells up, and prevents us from carrying the process further.

If we stop the process before the sulphurous vapours arise, the whole acid, diluted with a proportion of water, and mixed with charcoal, remains in the retort: but if we allow the process to go on, there is a continual decomposition of the acid, which is therefore diminished in quantity.

Mr. Phillips has ascertained the specific gravity of the products at different periods of the distillation. From sixteen ounces of acid, specific gravity 1.837, and an equal weight of spirit, specific gravity 0.830, he got twelve ounces of product; four of ethereal spirit of specific gravity 0.779; four more of specific gravity 0.753; then two and a half of yellow sulphurous spirit of specific gravity .784; and lastly, one and a half of heavy fluid of 0.981.

According to Proust, the sulphuric acid may be obtained from the black residuum in the retort, by diluting it with twice its weight of water, filtering it through linen, and evaporating it till it acquire the specific gravity 1.84, then adding about one five-hundreth part of nitrat of potass, and continuing the evaporation until the acid become perfectly colourless, and acquire the specific gravity of 1.86. The residuum, however, may be more advantageously preserved, as the Edinburgh college direct, for preparing more ether, by repeating the process with fresh quantities of alcohol. Proust indeed denies that this residuum is capable of converting more alcohol into ether; but that excellent chemist has somehow fallen into error, for it is a fact that was known in the time of that no less excellent chemist, Dr. Lewis, and inserted in his first edition of the Edinburgh Dispensatory, published in 1753, and not a recent discovery of Citizen Cadet, as Fourcroy would lead us to believe. If farther confirmation be wanted, we shall instance Gottling, who says, that from three or four pounds of this residuum, he has prepared sixty or seventy pounds of the spirit of vitriolic ether, and more than twelve pounds of vitriolic ether, without rectifying the residuum, or allowing the sulphurous vapour to evaporate.

Mr. Phillips, from a pound each of acid and of spirit, got seven

and a half ounces of ether, specific gravity 0.768; and by a second distillation, after eight ounces more of spirit were added to the residuum, eight ounces of 0.887. The mixture of these gave a specific gravity about 0.783, whereas the former of these products alone constitute the *Spiritus Ætheris Vitriolici* of the late Pharmacopœia. By adding the spirit ordered to convert it into *Spiritus Ætheris Vitriolici*, it acquires specific gravity 0.816, which is much weaker than the liquor of the same name in the former London Pharmacopœia.

The ether may be separated from the alcohol, water, and sulphurous acid, with which it is always mixed, by re-distilling it with a very gentle heat, after mixing it with potass, which combines with the acid, water and alcohol. The alkali ought to be added in substance, according to the directions of the Edinburgh college, not in solution as prescribed by that of London.

SPIRITUS ÆTHERIS NITROSI. *A. E.*

SPIRITUS ÆTHERIS NITRICI. *L.* SPIRITUS ÆTHEREUS NITROSUS. *D.*

Spirit of Nitrous Ether. Spirit of Nitric Ether.

Nitrous Ethereal Spirit.

Spiritus Nitri Dulcis. Sweet Spirit of Nitre.

Take of
Alcohol, ... two pints;
Nitric acid, . . . three ounces, by weight.

Pour the acid gradually upon the spirit and mix them, taking care that the heat do not exceed 120°, and distil with a gentle heat, 24 fluid ounces. *L.*

The action of nitric acid upon alcohol is so energetic, that great care is necessary in preparing the above. It will be seen that in nothing except the diction, does the formula of the United States' Pharmacopœia differ from that of London, unless indeed in the omission of specifying that the *acid* should be taken by weight.

A better mode of preparation, I think, is the following, which was given me some years ago by an experienced practical man of this city; who made the article very largely.

Take of
Purified nitre, ... ten pounds;
Alcohol, ... six and three-quarters gallons;
Sulphuric acid, . . . six and a half pounds.

Digest them together gently for six or eight hours, in the retort, and distil off six gallons.

The superiority of this process must be apparent; the very active ingredients, nitric acid and alcohol, do not come into immediate contact; but by the slow, progressing decomposition of the nitre by

the sulphuric acid, the nitric acid in its nascent state, as it escapes is taken up by the alcohol, and passes over into the receiver as the product wanted; whilst a sulphat of potash is left behind.

The only one of the British colleges which gives a formula for *Nitric or Nitrous Ether*, is that of Dublin. Why it should have been thought necessary, I cannot well imagine, since it is not employed in medicine. It is true they employ the *residuum* for the formation of the sweet spirit of nitre, by adding alcohol and distilling; but, altogether, it is troublesome, and the first part a hazardous process. It was not thought necessary to be introduced here. Any one desirous of making it, will find a more convenient process in Silliman's Journal, by Dr. Hare, Vol. II.

The general remarks on the process for the sweet nitrous spirit, as given in the Edinburgh Dispensatory, deserve attention.

The action of alcohol and nitrous acid upon each other is much influenced by their proportions. If we use a small proportion of alcohol, or pour alcohol into nitrous acid, there immediately takes place a great increase of temperature, and a violent effervescence and disengagement of red fumes. On the contrary, by placing the phials containing the alcohol and acid, in cold or rather iced water, they may be mixed, without danger, in the proportions directed by the colleges, and if the acid be added in small quantities at a time, and each portion thoroughly mixed with the alcohol by agitation, no action takes place until heat be applied. It is therefore unnecessary to keep the mixture for seven days, but we may immediately proceed to the distillation, which must be performed with a very slow and well regulated fire; for the vapour is very apt to expand with so much violence as to burst the vessels; and the heat must at no time exceed 212°, otherwise a portion of undecomposed acid will pass over and spoil the product.

Qualities of sweet spirit of nitre.—It is a colourless fluid of specific gravity .850.

Odour, extremely fragrant.

Taste, pungent and acidulous. It is very volatile and inflammable.

Chemical Composition—A portion of nitric ether and nitric acid combined with alcohol; for by diminishing the quantity of alcohol, we obtain a fluid having a similar relation to the spirit of nitrous ether, which sulphuric ether has to the spirit of sulphuric ether. By adding alcohol to the residuum of nitrous ether, the Dublin college, as we have stated, prepare their spirit of nitric ether, in the same way that spirit of sulphuric ether is prepared from the residuum of sulphuric ether; and by mixing nitrous ether with alcohol, we obtain a fluid exactly resembling spirit of nitrous ether.

Solubility.—It is soluble both in water and alcohol.

Incompatible substances. With a solution of *green sulphat* of iron, it strikes a deep olive colour, owing probably to its holding in solution a portion of nitrous gas; and with *Tincture of Guaiacum* it produces a green or blue coagulum. By age and exposure to the air, it is gradually decomposed, giving rise to the reproduction of nitrous

acid, from which it may be rectified, by saturating the acid with lime water, and distilling off the ethereal fluid.

I have been told that this article, which, when properly prepared, is an excellent medicine, has been *extemporaneously made*, by adding a few drops of nitric acid to an ounce or two of alcohol; the action that ensues, is necessarily productive of a small quantity of nitrous ether, which is held in solution by the alcohol; but this is a most fraudulent and injurious measure. It is also made of a quality proportionate to the price offered for it, by *ample* dilution.

Medical use.—Spirit of nitrous ether has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulencies, and moderately strengthens the stomach. It may be given in doses of from twenty drops to a drachm, in any convenient vehicle. Mixed with a small quantity of spiritus ammoniæ aromaticus, it proves a mild, yet efficacious diaphoretic, and often remarkably diuretic; especially in some febrile cases, where such a salutary evacuation is wanted. A small proportion of this spirit added to malt spirits, gives them a flavour approaching to that of French brandy.

ALETRIS FARINOSA. *A.* (*Secondary.*) *Star Grass. Star Wort.*

Although this plant is placed in the *secondary* list in the American Pharmacopœia, there can be little doubt that it better deserves a place amongst the standard articles than many there retained, if the high character awarded it by Professor Bigelow in his Medical Botany is confirmed by further experience. That gentleman says, "I know of no plant which surpasses the aletris farinosa in genuine, intense, and permanent bitterness. Neither aloes, gentian, nor quassia exceed it in the impression produced on the tongue." Vol. iii. p. 92.

It appears that the root is highly resinous, and contains extractive. That its alcoholic tincture is intensely bitter; its decoction moderately so. It possesses but little if any tannin or gallic acid, since chalybeat solutions undergo little change from its addition.

It is used as a tonic and stomachic.

ALKALI.

An Arabian word introduced in chemistry, after it had long been applied to designate a plant which still bears the name of *kali;* hence the word above, is often very incorrectly spelled *alcali.*

Three alkalies were formerly described, viz: two fixed and one volatile, under the names of

Potass, ... or fixed vegetable alkali.
Soda, ... or fixed mineral alkali.
Ammonia, ... or volatile alkali.

It being however discovered, that other substances possessed properties analogous to those which characterize the above, they were by some chemists arranged in the same class of bodies; such were barytes, strontia, lime, magnesia; and of late, several other principles derived from vegetables, and of a compound nature, have been found to possess a right to a similar arrangement; such are morphine, strychnine, &c. These will be mentioned more particularly under their appropriate places.

As to the general properties of alkalies, they are defined to be incombustible, soluble in water, caustic, and capable of neutralizing the acids, of combining with alcohol, oils, earths, sulphur, and phosphorus, and of changing vegetable blues and reds to green: But as many of these properties are possessed in a greater or less degree by substances usually classed with the earths, and as there is a continual gradation from the insipidity, insolubility, and infusibility of silica, to the causticity, solubility, fusibility, and comparative volatility of potass, they may be classed together under the general name of Salifiable Bases.

ALLIUM. *A.* Allium Sativum. *E. L. D.*

Garlic. The root.

The garlic is a perennial bulbous-rooted plant, which grows wild in Sicily, and is cultivated in our gardens. The root consists of five or six small bulbs, called *cloves*, inclosed in one common membranous coat, but easily separable from each other. All the parts of this plant, but more especially the roots, have a strong, offensive, very penetrating and diffusible smell, and an acrimonious, almost caustic, taste. The root is full of a limpid juice, of which it furnishes almost a fourth part of its weight by expression. The root loses about half its weight by drying, but scarcely any of its smell or taste.

By Neumann's analysis, it lost two-thirds of its weight by exsiccation. By decoction from 960 parts, water extracted 380, and the residuum yielded 27 to alcohol, and was reduced to 40. Alcohol applied first, extracted 123, the residuum yielded 162 to water, and was reduced to 40. In both cases the alcoholic extract was unctuous and tenacious, and precipitated metallic solutions. But the active ingredient was a yellowish thick ropy essential oil, according to Hagen, heavier than water, not amounting to more than 1.3 of the whole, in which alone resided the smell, the taste, and all that distinguishes the garlic.

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Medical use.—Applied externally, it acts successively as a stimulant, rubefacient, and blister. Internally, from its very powerful and diffusible stimulus, it is often useful in diseases of languid circulation and interrupted secretion. Hence in cold, leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, sudorific: it has also been by some supposed to be emmenagogue. For the same reason, in cases in which a phlogistic diathesis, or other irritability prevails, large doses of it may be very hurtful.

It is sometimes used by the lower classes as a condiment, and also enters as an ingredient into many of the epicure's most favourite sauces. Taken in moderation, it promotes digestion; but in excess, it is apt to produce headach, flatulence, thirst, febrile heat, and inflammatory diseases, and sometimes occasions a discharge of blood from the hæmorrhoidal vessels.

In fevers of the typhoid type, and even in the plague itself, its virtues have been much celebrated.

Garlic is with some also a favourite remedy in the cure of intermittents; and it has been said to have sometimes succeeded in obstinate quartans, after the Peruvian bark had failed. In catarrhal disorders of the breast; asthma, both pituitous and spasmodic; flatulent colics; hysterical and other diseases, proceeding from laxity of the solids, it has generally good effects: it has likewise been found serviceable in some hydropic cases. Sydenham relates, that he has known the dropsy cured by the use of garlic alone; he recommends it chiefly as a warm strengthening medicine in the beginning of the disease.

It is much recommended by some as an anthelmintic, and has been frequently applied with success externally as a stimulant to indolent tumours, in cases of deafness proceeding from atony or rheumatism, and in retention of urine, arising from debility of the bladder.

Garlic may be either exhibited in substance, and in this way several cloves may be taken at a time without inconvenience, or the cloves cut into slices, may be swallowed without chewing. This is the common mode of exhibiting it for the cure of intermittents.

The expressed juice, when given internally, must be rendered as palatable as possible by the addition of sugar and lemon juice. In deafness, cotton moistened with the juice is introduced within the ear, and the application renewed five or six times in one day.

Infusions in spirit, wine, vinegar, and water, although containing the whole of its virtues, are so acrimonious, as to be unfit for general use; and yet an infusion of an ounce of bruised garlic in a pound of milk, was the mode in which Rosenstein exhibited it to children afflicted with worms.

But by far the most commodious form for administering garlic, is that of a pill or bolus conjoined with some powder, corresponding with the intention of giving the garlic. In dropsy, calomel forms a most useful addition. It may also sometimes be exhibited with advantage in the form of a clyster.

Garlic made into an ointment with oils, &c. and applied externally, is said to resolve and discuss indolent tumours, and has been by some greatly esteemed in cutaneous diseases. It has likewise sometimes been employed as a repellent. When applied under the form of a poultice to the pubes, it has sometimes proved effectual in producing a discharge of urine, when retention has arisen from a want of due action in the bladder. Sydenham assures us, that among all the substances which occasion a derivation or revulsion from the head, none operates more powerfully than garlic applied to the soles of the feet: he was led to make use of it in the confluent small-pox: about the eighth day after the face began to swell, the root cut in pieces and tied in a linen cloth, was applied to the soles, and renewed once a-day till all danger was over.

The most powerful antidotes to the flavour of this tribe of vegetables, are the aromatic leaves and seeds of the *umbelliferæ;* thus the disagreeable odour of a person's breath after the ingestion of an onion, is best counteracted by parsley; and if leek or garlic be mixed with a combination of aromatic ingredients, its virulence will be greatly mitigated and corrected.—*Paris' Pharmacologia,* 240.

Allium Cepa. *D. Onion. The root.*

This is also a perennial bulbous-rooted plant. The root is a simple bulb, formed of concentric circles. It possesses in general the same properties as the garlic, but in a much weaker degree. Neumann extracted from 480 parts of the dry root, by means of alcohol, 360, and then by water 30; by water applied first, 395, and then by alcohol, 30: the first residuum weighed 56, and the second 64. By distillation the whole flavour of the onions passed over, but no oil could be obtained.

Wiegleb says, that all this class of vegetables, as well as the acrid cruciform, owe their acrimony to a subtile essential oil, and that they contain combined ammonia, which can be obtained by distillation with a solution of potash. Vauquelin ascribes its acrimony to volatile oil combined with sulphur, and its sweetness to uncrystallizable sugar with mucus, gluten, and animo-vegetable matter.

Medical uses.—Onions are considered rather as articles of food than of medicine: they are supposed to yield little or no nourishment, and when eaten liberally produce flatulencies, occasion thirst, headachs and turbulent dreams; in cold phlegmatic habits, where viscid mucus abounds, they doubtless have their use; as by their stimulating quality they tend to excite appetite, and promote the secretions: by some they are strongly recommended in suppressions of urine and in dropsies. The chief medicinal use of onions in the present practice is in external applications, as a cataplasm for suppurating tumours, &c.

Allium Porrum. *L.* *Leek.* *The root.*

The common leek is rather an article of the Materia Alimentaria, than of the Materia Medica. In its properties, it is analogous to garlic, but weaker even than the common onion. A decoction of the beards or filaments of the bulbs is supposed by the vulgar to be lithontriptic.

ALOE.—*ALOES.*

The London college now agree with that of Dublin, and with Thunberg, in indicating the *Aloë spicata* as the species which produces the Socotorine aloes, and they assume as the source of the Barbadoes aloes, a species to be described under the name of *Aloe vulgaris*, in the great work of the late Dr. Sibthorpe, the Flora Græca, now preparing for publication by Dr. Smith, who informed Dr. Powell, "that the plant described under the above name is asserted by Dr. Sibthorpe to be the true *Aloe* of Dioscorides, which is described as producing our officinal Barbadoes aloes by Sloane, in his history of Jamaica."

During the first four years that the Cape of Good Hope was in possession of the British, more than 300,000 pounds, the produce of that settlement, were imported into England; and as this quantity was infinitely greater than could be required for the purposes of medicine, it is not improbable, that, as Mr. Barrow states, its principal consumption was by the London porter brewers.

ALOE SOCOTRINA. *A.* *Socotrine Aloes.* *The extract.*

Aloe Spicata. *L.* Aloe Socotorina. *D.* Aloe Perfoliata. *E.*

The Gum resin or Extract, called Socotorine Aloes. Cape Aloes.

ALOE BARBADENSIS. *A.* *Barbadoes Aloes.* *The extract.*

Aloe Vulgaris. *L.* Aloe Hepatica. *E. D.*

Common, or Barbadoes, or Hepatic Aloes.

Socotorine Aloes.—This species which is the most esteemed, is brought, wrapt up in skins, from the island of Socotora in the Indian Ocean. It is dark coloured, of a glossy clear surface, and in some degree pellucid; in mass, of a yellowish red colour, with a purple cast; fracture unequal; easily pulverisable; when reduced to powder, of a bright golden colour. It is hard and friable in the winter, somewhat pliable in summer, and growing soft between the fingers.

Its taste is bitter and disagreeable, though accompanied with some aromatic flavour; the smell is not very unpleasant, and somewhat resembles that of myrrh. It is said not to produce hæmorrhoidal affections so readily as Barbadoes aloes.

It is prepared in July, by pulling off the leaves, from which the juice is expressed, and afterwards boiled and skimmed. It is then preserved in skins, and dried in August in the sun. According to others, the leaves are cut off close to the stem, and hung up. The juice which drops from them without any expression, is afterwards dried in the sun.

Barbadoes or Hepatic Aloes, is of two kinds, the one from the East Indies, the other from Barbadoes. The former has a light brown, or reddish yellow colour, a clean fracture, and possesses nearly the same medical properties as the socotorine. Barbadoes aloes is not so clear and bright as the foregoing sort; it is also of a darker colour, more compact texture, and for the most part drier; though not so brittle. Its smell is much stronger and more disagreeable; the taste intensely bitter and nauseous, with little or nothing of the aromatic flavour of the socotorine. The best hepatic aloes from Barbadoes is in large gourd shells, and an inferior sort of it, which is generally soft and clammy, is brought over in casks. In Barbadoes the plant is pulled up by the roots, and carefully cleaned from the earth and other impurities. It is then sliced into small hand-baskets and nets, which are put into large iron boilers with water, and boiled for ten minutes, when they are taken out, and fresh parcels supplied till the liquor is strong and black, which is then strained into a deep vat, narrow at bottom, where it is left to cool and to deposit its feculent parts. Next day the clear liquor is drawn off by a cock, and again committed to a large iron vessel. At first it is boiled briskly, but towards the end it is slowly evaporated, and requires constant stirring to prevent burning. When it becomes of the consistence of honey, it is poured into gourds or calabashes for sale, and hardens by age. Barbadoes aloes is extremely apt to induce hæmorrhoids; but it is generally preferred, because it is very difficult to adulterate it without altering its appearance.

There is a third kind found in commerce under the name of

Caballine or Horse Aloes.

It is easily distinguished from both the foregoing kinds by its strong rank smell; although, in other respects, it agrees pretty much with the hepatic, and is not unfrequently sold in its stead. Sometimes the caballine aloes is prepared so pure and bright, as not to be distinguishable by the eye even from the socotorine, but its offensive smell, of which it cannot be divested, readily betrays it. Its fracture also resembles that of common rosin, with which it is often adulterated, whereas the fracture of socotorine aloes is unequal and irregular.

Chemical Composition.—In this there appears to be some obscurity; Mr. Braconnot (Ann. de Chim. tom. 68,) conceives it to be a substance, *sui generis,* which he terms "*bitter resin;*" whilst others regard it as composed of resin, gum, and extractive, the proportions of which are supposed to vary in the different species, but that their peculiar virtues reside in the extractive part.

From sixteen ounces of aloes, Neumann extracted near fifteen by means of alcohol. From the residuum water took up one drachm, about an ounce of impurities being left; on inverting the procedure, and applying water first, he obtained but thirteen ounces and a half of watery extract, and from the residuum alcohol dissolved an ounce and a half. According to this analysis, 1000 parts of aloes contain about 7.8 soluble in water only, or analogous to gum, 94 soluble in alcohol only, or resinous matter, and 825 soluble both in alcohol and water or extractive. Tromsdorff makes them consist of 25 resin and 75 extractive, and Lagrange of 32 resin and 86 extractive. Dr. Lewis also remarks, that decoctions of aloes let fall a precipitate, as they cool, probably from extractive being more soluble in boiling than in cold water. He also found the hepatic aloes to contain more resin and less extractive than the socotorine, and this less than the caballine. Tromsdorff, on the contrary, gives 81.25 extractive, 6.25 resin, and 12.50 albumen, as the constituents of hepatic aloes. Boulduc also found in socotorine aloes one-fourth, and in hepatic aloes one-third of resin. The resins of all the sorts, purified by alcohol, have little smell; that obtained from the socotorine has scarce any perceptible taste; that of the hepatic, a slightly bitterish relish; and the resin of the caballine, a little more of the aloetic flavour. The extractive obtained separately from any of the kinds is less disagreeable than the crude aloes: the extractive of socotorine aloes has very little smell, and is in taste not unpleasant; that of the hepatic has a somewhat stronger smell, but is rather more agreeable in taste than the extract of the socotorine: the extractive of the caballine retains a considerable share of the peculiar rank smell of this sort of aloes, but its taste is not much more unpleasant than that of the extractive obtained from the two other sorts.

Medical use.—Aloes is a bitter stimulating purgative, exerting its action chiefly on the rectum. In doses of from 5 to 15 grains it empties the large intestines, without making the stools thin; and likewise warms the habit, quickens the circulation, and promotes the uterine and hæmorrhoidal fluxes. If given in so large a dose as to purge effectually, it often occasions an irritation about the anus, and sometimes a discharge of blood.

It is to the slowness with which aloes is dissolved in the primæ viæ, that it is indebted for the medicinal properties which distinguish it; by boiling water it is dissolved, but on cooling a precipitation occurs, and by long decoction it becomes quite inert; weak acids dissolve it more abundantly than water, but proof spirit is its most perfect solvent. Its solubility is increased by alkaline salts and soaps, but by such combination, aloes undergoes a material change in its medicinal properties; the bitterness is diminished, its purga-

tive effects impaired, and it ceases to operate specifically upon the large intestines; a fact, the knowledge of which is valuable, as it enables us in certain cases to obviate its irritating action upon the rectum.

It is frequently employed in cases of suppression of the menses, or of the hæmorrhoidal discharge; but it is particularly serviceable in habitual costiveness, to persons of a phlegmatic temperament and sedentary life, and where the stomach is oppressed and weakened. For its use in typhus fever, scarlatina, cynanche maligna, marasmus, chlorosis, hæmatemesis, chorea, hysteria, and tetanus, Dr. Hamilton's excellent work on purgatives may be consulted. Aloes is also used as an anthelmintic, both given internally and applied to the abdomen in the form of a plaster. Dissolved in alcohol, it is employed to check hæmorrhagies in recent wounds, and as a detergent in ulcers.

Aloes is administered either

a. Simply, or

b. In composition:

1. With purgatives. Soap, scammony, colocynth, rhubarb.
2. With aromatics. Canella.
3. With bitters. Gentian.
4. With emmenagogues. Iron, myrrh.

It is exhibited in the form of

a. Powder; too nauseous for general use.

b. Pill; the most convenient form.

c. Solution in wine or diluted alcohol.

From its extreme bitterness, the form of pill is best adapted for its employment.

Aloes form the basis of most of the antibilious and purging pills sold as patent medicines, thus we have,

Anderson's pills—Composed of Barbadoes Aloes, with a proportion of jalap and oil of aniseed.

Hooper's pills—Composed of the pil. aloës cum myrrha (the former pil. Rufi,) sulphat of iron and canella bark, with a portion of ivory black.

Fothergill's pills.—Aloes, scammony, colocynth, and oxyd of antimony. *Cum multis aliis!*

ALTHÆA OFFICINALIS. *E.* Althæa. *L.*

Marsh Mallow. The Root and Leaves.

The marsh-mallow is a perennial plant, which is found commonly on the banks of rivers, and in salt marshes.

The whole plant, but especially the root, abounds with mucilage. The roots are about the thickness of a finger, long and fibrous. They are peeled and dried, and then are perfectly white.

Medical use.—It is used as an emollient and demulcent, in diseases attended with irritation and pain, as in various pulmonary complaints, and in affections of the alimentary canal and urinary organs; and it is applied externally in emollient fomentations, gargles, and clysters.

AMMONIA.—*VOLATILE ALKALI.*

This very extraordinary substance was, for a time, considered as a simple body. It was first discovered by Dr. Priestley. The artiticle known by the name of ammonia, anterior to that period, was the carbonat.

Ammonia consists of one part of nitrogen, with three of hydrogen by bulk, or of three of hydrogen and thirteen of nitrogen by weight. It exists in its purest form combined with caloric as a gas, which is perfectly transparent and colourless, elastic and compressible; specific gravity 8 to hydrogen, or 100 cubic inches weigh eighteen grains. It has an urinous and acrid odour, irritating the nostrils and eyes, and an acrid and caustic taste; it does not dissolve animal substances; is irrespirable; extinguishes flame; colours vegetable blues green; and is decomposed by being transmitted through a red-hot tube, and by the electric spark, into its constituent gases; and by oxygen and atmospheric air at a red heat, and by oxy-muriatic acid, it is converted into water and nitrogen gas. It is absorbed without change by porous bodies; it dissolves sulphur and phosphorus; and combines readily with water in all its states. Water at a mean temperature and pressure is saturated by 670 times its volume of gaseous ammonia, and is thereby increased in bulk, and acquires the specific gravity of 0.875. Ammonia combines with all the acids, forming neutral salts. It is formed during the putrefactive fermentation.

Ammonia, in its gaseous form, is not an article of the Materia Medica: but if made to impregnate water, or alcohol, it then becomes so, under the names of *Aqua*, and *Spiritus* Ammoniæ.

Ammoniæ Murias. *A. L. E. D. Muriat of Ammonia.*

Sal Ammoniac. Hydrochlorat of Ammonia.

Muriat of ammonia is found native, especially in the neighbourhood of volcanos. It was first prepared in Egypt from the soot of camel-dung by sublimation. But the greatest part of that now used, is manufactured in Europe, either by combining directly ammonia with muriatic acid, or by decomposing the sulphat of ammonia by means of muriat of soda, or the muriats of lime and magnesia by means of ammonia.

In commerce, muriat of ammonia occurs either sublimed in firm, round, elastic, concavo-convex cakes, or crystallized in conical masses. The latter commonly contain other salts, especially muriat of lime, which renders them deliquescent; and therefore the sublimed muriat of ammonia is to be preferred for the purposes of medicine.

Muriat of ammonia has an acrid, pungent, urinous taste. It is soluble in about three times its weight of water at 60°, and in an equal weight at 212°. During its solution, it produces 32 degrees of cold. It is also soluble in about 4.5 parts of alcohol. It is permanent in the ordinary state of the atmosphere. By a gentle heat, it may be deprived of its water of crystallization, and reduced to the form of a white powder. At a higher temperature it sublimes unchanged. Its crystals are either six-sided pyramids, aggregated in a plumose form, or still more commonly four-sided pyramids. It consists of 42.75 muriatic acid, 25.00 ammonia, and 32.25 water. But in consequence of the present unsettled opinions respecting the nature of muriatic acid and ammonia, and the changes which they undergo by combination with each other, the composition of this salt is involved in much obscurity. According to Dr. Thomson, it consists of equal volumes of muriatic acid gas, and ammoniacal gas; or it may be a compound of *chlorine* and *ammonium*, the hypothetical base of ammonia. Unlike all other ammoniacal salts, it is not decomposed by heat; which may be regarded as strong evidence of its being a compound of chlorine, and an unknown base.

Incompatible Substances.—The sulphuric and nitric acids unite with the ammonia, and expel the muriatic acid. On the contrary, ammonia is disengaged by the action of potash and its carbonat, carbonat of soda, lime, magnesia, &c., which combine with the muriatic acid. All metallic salts, whose bases form insoluble compounds with muriatic acid, as silver, lead, are incompatible.

Medical use.—Muriat of ammonia is now seldom used internally. It was formerly supposed to be a powerful aperient and attenuant of viscid humours.

Externally applied, it is a valuable remedy. It may act in two ways,

1. By the cold produced during its solution.

It is from this cause that fomentations of muriat of ammonia probably prove beneficial in mania, apoplexy from plethora, and in violent headachs. When used with this intention, the solution should be applied as soon as it is made.

2. By the stimulus of the salt.

On this principle we may explain its action as a discutient in indolent tumours of all kinds, contusions, gangrene, psora, ophthalmia, cynanche; and in stimulating clysters. In some cases, as in chilblains and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part,

and the subsequent stimulus will excite a more healthy action in the vessels.

If pure, this salt should be entirely volatilized at a low heat, If sulphat of ammonia be present, which also is volatile, this may be detected by muriat of barytes.

Muriat of ammonia is the salt from which all the principal pharmaceutic preparations are made.

AQUA AMMONIÆ. *A. E.*

Aqua Ammoniæ Causticæ. *D.* Liquor Ammoniæ. *L.*

Water of Ammonia. Water of Caustic Ammonia. Liquor of Ammonia.

Take of

Muriat of ammonia, in powder, . . . one pound;
Lime, fresh burnt, ... one pound and a half;
Water, ... one gallon.

Add to the lime, two pints of the water; let them stand until the lime is slacked, then put the lime into a glass retort, resting on a sand bath, to the beak of which is connected a large glass receiver, which is to be kept cold; add to the lime the muriat of ammonia, and the remainder of the water; and distil with a slow fire, until the liquid in the receiver amount to two pints.

The formula here adopted, is apparently injudicious; the quantity of water (one gallon) being far greater than is required to absorb all the ammonia, renders it necessary to employ retorts of large size. It is true, the remaining muriat of lime, formed during the process, and left in the retort, is thereby retained in solution; but as it is one of the most soluble salts, a much inferior quantity would answer this end. The process differs from that recommended by the London college, chiefly in using more lime, and in this particular, it is preferable. In our opinion, the Edinburgh formula is superior to the others; in it, the ammonia passes over as a gas, which combines with the water placed in the receiver.

Dörfurt, Bucholz, and Van Mons, agree in recommending nearly the following process, which resembles that of the Edinburgh college. Slake sixteen ounces of lime with a sufficient quantity of water to form a thick paste; put it into a cucurbit, and add sixteen ounces of sal ammoniac; lute on the capital, furnished with a bent tube, reaching to the bottom of a receiver containing twenty-four ounces of water, and draw off twenty-four ounces, so as to fill the space of forty-eight ounces, previously marked on the receiver, and keep it in phials perfectly closed, by dipping their necks when corked in wax.

The specific gravity of the aqua ammoniæ as prepared by the United States' Pharmacopœia, is not stated. That of the Dublin college is .936, that of London, .960.

Table of the quantities of Real or Gaseous Ammonia in solutions of different Specific gravities. (Dalton.)

Specific Gravity.	Grains of ammonia in 100 water grain measures of liquid.	Grains of ammonia in 100 grains of liquid.	Boiling point of the liquid. Fahr. scale.	Volume of gas condensed in a given vol. of liquid.
.85	30	85.3	26°	494
.86	28	32.6	38	456
.87	26	29.9	50	419
.88	24	27.3	62	382
.89	22	24.7	74	346
.90	20	22.2	86	311
.91	18	19.8	98	277
.92	16	17.4	110	244
.93	14	15.1	122	211
.94	12	12.8	134	180
.95	10	10.5	146	147
.96	8	8.3	158	116
.97	6	6.2	173	87
.98	4	4.1	187	57
.99	2	2	196	28

Sir Humphrey Davy's results were somewhat different. He found 100 parts of specific gravity 0.875, to contain 32.5 of ammonia; of specific gravity 0.9054, 25.37; and of specific gravity 0.9692, 9.5 of ammonia.

Water of ammonia decomposes many of the earthy, and all the metalline salts, and is capable of dissolving, or combining with many of the metallic oxyds, and even of oxydizing some of the metals. When pure, water of ammonia does not effervesce with any of the acids, or form a precipitate with alcohol. As it readily absorbs carbonic acid from the atmosphere, the Edinburgh college, very properly, order it to be kept in small phials By neglecting this precaution in the shops, it becomes carbonated before the large bottles, in which it is often kept, be half done, or it becomes weakened.

Qualities.—Form, a limpid colourless fluid, specific gravity .960, or one fluid ounce weighs about 438 grains.

Odour.—Strong and pungent. *Taste.*—Extremely caustic.

Chemical Composition.—A solution of ammoniacal gas in water, varying considerably in strength, in the different pharmacopœias. It is an active solvent of many vegetable principles. With alcohol it unites in every proportion. It assists the oxydizement of copper and zinc, and dissolves many of the metallic oxyds.

Adulterations.—The aqua ammoniæ should contain nothing but the volatile alkali; and if properly saturated, its specific gravity at 60° Fahr. will be about .905, free from carbonic acid.

The carbonic acid is shown by a precipitation, on mixing the solution with one of muriat of lime, which earthy salt is not precipitated by *pure* ammonia. If other salts are present, they may be discovered by saturating a portion with *pure* nitric acid, and adding the requisite tests.

Medical use.—Rarely given internally; but in doses of five to twenty drops, largely diluted, it acts as a powerful stimulant. Externally, it is applied to the skin as a rubefacient, chiefly, however, combined with sweet oil, forming a saponaceous liniment.

The Edinburgh college have adopted a formula, under the name of

AQUA AMMONIÆ DILUTA. *Diluted Water of Ammonia.*

Take of
  Water of ammonia, . . . one part;
  Distilled water, ... two parts;
Mix them.

This formula for a diluted solution of ammonia, we are told, is absolutely necessary; for water of ammonia, of the strength obtained by the direction of the colleges, is perfectly unmanageable. This is true, but it would seem unnecessary to introduce a specific formula for the mere purpose of dilution, which might always be done at the moment, as heretofore.

ALCOHOL AMMONIATUM. *A. Ammoniated Alcohol.*

SPIRITUS AMMONIÆ. *L. D. Spirit of Ammonia.*

Spirit of Sal Ammoniac.

Take of
  Alcohol, ... two pints;
  Lime, recently burnt, ... one pound;
  Muriat of ammonia, in powder, . . . eight ounces;
  Water, ... half a pint.
Add the water to the lime, let them stand till the lime is slacked; then put the lime into a glass retort resting on a sand bath, to the beak of which is connected a glass receiver, which is to be kept cold; add to the lime the muriat of ammonia and the alcohol, and distil with a slow fire until the liquid in the receiver amounts to one pint and a half.

It may be a question, why only a pint and a half of spirit are distilled over? unless, indeed, the alcohol contained in the two pints in the prescription, may be presumed to pass over in the above amount.

The Edinburgh formula, which is the same as that of the United States, direct the distillation as long as gaseous fluid come over. The directions given in our national work, are not sufficiently definite; as the use of the sand bath is not mentioned; which is, perhaps, nearly as essential in this process, as in that for the aqua ammoniæ.

This preparation, which is a solution of ammoniacal gas, in spirit, in place of water, is not much employed as a medicine by itself; it is rather as the basis of some other compounds hereafter to be noticed.

AMMONIÆ CARBONAS. *A.* CARBONAS AMMONIÆ. *E. D.*

Carbonat of Ammonia.

AMMONIÆ SUB-CARBONAS. *L. Sub-Carbonat of Ammonia.*

Ammonia Præparata. Sal Volatile, &c.

Take of
Muriat of ammonia, ... one pound;
Soft carbonat of lime, dried, . . . one pound and a half.
Having triturated them separately, mix them thoroughly, and sublime from a retort into a receiver kept cool.

The formula of the London college is here followed by the United States' Pharmacopœia; why did it not adopt the name? assuredly the salt in question is not neutral; it is strictly entitled to the name of *Sub*-Carbonat.

The neutral carbonat of bi-carbonat of ammonia was formed by Berthollet, by impregnating a solution of sub-carbonat with carbonic acid gas. According to his experiments, it is composed of

Ammonia,	28.19	100	39.2
Carbonic acid,	71.81	255	100.
	100.	355	139.2

From the known specific gravity of those two bodies, Gay Lussac has calculated that the neutral carbonat consists of exactly equal quantities by *measure* of the two gases, while the sub-carbonat is composed of two volumes of alkaline gas to one of carbonic acid gas.

This is a case of mutual decomposition. The carbonat of ammonia formed, being volatile, passes over into the receiver; the muriat of lime remains in the retort. It is more generally made in the large way. The chalk employed, should always be very carefully dried; as the presence of moisture injures the product. It requires a considerable heat to promote the mutual action of the substances on each other. Göttling says, that the sublimation must be conducted in the open fire, and therefore uses an earthenware cucurbit, with a tubulated capital. When a glass retort is employed, it should have a very wide neck; and the best form for the receiver is cylindrical, as it enables us to get out the carbonat of ammonia condensed in it without breaking it. The residuum which remains in the retort, furnishes muriat of lime by lixiviation and evaporation.

Sometimes carbonat of potass or soda, is employed for the preparation of carbonat of ammonia. The theory of the process is the same, and the decomposition is effected at a lower temperature. But as potass or soda are very rarely saturated with carbonic acid, part of the ammonia is evolved in the form of gas, which, if not permitted to escape, will burst the vessels. To prevent this loss, therefore, Mr. Göttling uses a cucurbit and capital, furnished with a bent tube, which is to be immersed in a phial of water; by which contrivance, while

the carbonat of ammonia is condensed in the capital, the gaseous ammonia is absorbed by the water. The residuum contains either muriat of potass or soda.

Qualities.—Form, white, semi-transparent masses, fibrous texture, effervescing on exposure to air.

Odour.—Pungent and peculiar. *Taste.*—Acrid, but cooling.

Chemical Composition.—Varies materially, according to the temperature employed in its preparation. As usually prepared, Mr. Phillips says it contains about half its weight of carbonic acid; its composition being carbonic acid, 50, ammoniac 39, water 11. It is, indeed, said to differ in the amount of alkali contained, from fifty to twenty per cent. As a medicine, this is a fact of infinite importance to its value.

Solubility.—About three times its weight of cold water are required to dissolve it. Increase of temperature augments its solubility; approach to a boiling heat, volatilizes, and partially decomposes it. Insoluble in alcohol, and hence the addition of spirit to a strong solution, produces a dense coagulum.

Incompatibles.—Acids, fixed alkalies and their carbonats, lime, magnesia, alum, super tartrat of potass, and all acidulous salts, sulphat of magnesia, acetat of mercury, calomel, and corrosive sublimate, super acetat of lead, tartarized iron, and sulphats of iron and zinc. If added to decoctions or infusions, they must be previously cooled. It is best exhibited in the form of a pill, or julep.

Medical use.—It exactly resembles ammonia in its action, except that it is weaker, and its efficacy as a stimulant, must, therefore, depend on the *excess of ammonia* in it, or the unsaturated part. It is probable, a perfectly neutral carbonat of ammonia would be no more efficient, than an *equal* dose of acetat or muriat of the same salt. If it meets with an acid in the stomach, it is immediately decomposed, and a new salt will necessarily be produced. Unequal as it is in strength,* we are never certain of administering the same amount; it would therefore, be well to dismiss it from use, and employ the aqua ammonia in its place. Given as it usually is, in the low states of disease, with other *powerful* stimulants, as wine, brandy, &c. it is probably much overrated in practice.

In large doses (half a drachm to two scruples) it is said to be emetic. It has been found useful in gastric affections, which supervene habits of irregularity and debauchery; probably by its alkalescent nature in neutralizing acid, which not unfrequently attends it. It is employed for smelling to, in syncope, hysteria, &c., and is used in preparing some other articles of medicinal employment.

Its *dose* is from five to twenty grains.

Adulteration.—It ought to be entirely volatilized by heat. If any

* By Dalton's experiments on this subject, 100 grains of carbonat of ammonia lost as follows, by exposure to a temperature of 45°.

In 4 hours,	lost 20 grains.
8	43
11	48 1-2
13	49 1-2
24	50

thing remain, when it is laid on a heated iron, carbonat of potash or lime may be suspected; and this is not unlikely to be the case, if the salt be purchased in form of powder. Always purchase it in *solid* lumps. Sulphuric or muriatic salts, lime, iron, &c. may be discovered by adding to the alkali, saturated with nitric acid, the appropriate tests.* It ought to be free of every smell, excepting its peculiar ammoniacal odour. Dr. Paris asserts, that there is a large quantity of an impure salt at present in the English market, manufactured from the residuum of the gas-light manufactories.

AQUA AMMONIÆ CARBONATIS. *A. D.*

SOLUTIO SUBCARBONATIS AMMONIÆ. *E.*

LIQUOR AMMONIÆ SUBCARBONATIS. *L.*

Water of Carbonat of Ammonia.

Solution or Liquor of Sub-Carbonat of Ammonia.

Take of
Muriat of ammonia;
Carbonat of potass, each . . . sixteen ounces;
Water, ... two pints.

Having mixed the salts and put them into a glass retort, pour the water upon them, and distil to dryness in a sand bath, gradually increasing the heat.

In Duncan's seventh edition of the Edinburgh Dispensatory, for 1813, will be found the above formula. Why this trouble should have been taken for the formation of an article which can *at once* be made by dissolving the *preceding* salt in water, is difficult to say; certainly, prepared in the way adopted in the Pharmacopœia, it is by no means superior, if equal to that at present pursued, both by the Edinburgh and London colleges, viz. by dissolving one part of the sub-carbonat in four of distilled water. This last is even more economical, since the *muriat of potass* left in the retort, is of no use.

A plan I have pursued, not unfrequently, to prepare this solution, is to impregnate the aqua ammoniæ placed in the middle vessel of Nooth's apparatus, with carbonic acid, evolved from marble, by muriatic acid. It is expeditious and easy of execution; but possesses no superiority over the common solution of the solid sub-carbonat. The specific gravity of the solution, as given by the Dublin college, which alone prepares it by the present plan of our pharmacopœia, is 1095. Dr. Henry, in his Chemistry, says it should have the specific gravity of 1150; that it should effervesce on the addition of acids; and should afford a strong coagulum on adding (twice its bulk, Paris,) alcohol.

This article is scarcely used in medicine, and might, without injury, have been omitted; the solid carbonat being amply adequate,

* Muriat of barytes, nitrat of silver, oxalat of ammonia, tincture of galls, &c.

and when the Pharmacopœia may undergo revision, it is hoped this suggestion may serve to simplify it.

Its dose is twenty to sixty drops, still further diluted.

Liquor Volatilis Cornu Cervini. *D.*

Volatile Liquor of Hartshorn. Spirit of Hartshorn, &c.

Take of

Hartshorn any quantity.

Distil with a fire gradually increased, the volatile liquor, salt, and oil. Repeat the distillation of the volatile liquor until it becomes as limpid as water, separating by filtration, the oil and salt after each distillation. The liquor is more easily purified, if, after each distillation, except the first, we add one-sixth of wood charcoal, previously heated to redness, then extinguished, by covering it with sand, and powdered while hot.

This is an impure sub-carbonat of ammonia, of no use in medicine, which the preceding articles cannot supply; it is wisely rejected by the framers of our Pharmacopœia, as well as by those of London and Edinburgh.

So many repetitions of the *same substance*, (*under different names*,) might well expose the recommenders of them to ridicule.

The wholesale dealers have very large pots for this distillation, with earthen heads, almost like those of the common still; for receivers, they use a couple of oil jars, the mouths of which are luted together; the pipe that comes from the head, is connected by means of an adopter with the lower jar, which is also furnished with a cock for drawing off the fluids condensed in it. The upper jar is entire, and in it is condensed the solid carbonat of ammonia. When a large quantity of the subject is to be distilled, it is customary to continue the operation for several days successively; only unluting the head occasionally, to put in fresh materials. When the upper jar becomes entirely filled with carbonat of ammonia, it cracks. It is then to be removed, the salt to be taken out of it, and a fresh one substituted in its place.

When only a small quantity of spirit or salt is wanted, a common iron pot, such as is usually fixed in sand furnaces, may be employed; an iron head being fitted to it. The receiver ought to be large, and a glass, or rather tin adopter, inserted between it and the pipe of the head.

The distilling vessel being charged with pieces of horn, a moderate fire is applied, which is slowly increased, and raised at length almost to the utmost degree. At first water arises, which gradually acquires colour and smell, from the admixture of empyreumatic oil and ammoniacal salts; carbonat of ammonia next arises, which at first dissolves, as it comes over, in the water, and thus forms what is called the *spirit*. When the water is saturated, the remainder of the salt concretes in a solid form to the sides of the recipient. If it

be required to have the whole of the salt solid, and undissolved, the water should be removed as soon as the salt begins to arise, which may be known by the appearance of white fumes; and that this may be done the more commodiously, the receiver should be left unluted, till this first part of the process be finished. The white vapours which now arise, sometimes come over with such vehemence as to throw off or burst the receiver: to prevent this accident, it is convenient to have a small hole in the luting, which may be occasionally stopped with a wooden peg, or opened, as the operator shall find proper. Lastly, the oil arises, which acquires greater colour and consistency as the operation advances. Carbonat of ammonia still comes over, but it is partly dissolved in the hot oily vapour. At the same time, there is a considerable disengagement of gas, consisting of a mixture of carbureted hydrogen often containing sulphur and phosphorus, and of carbonic acid.

All the liquid matters being poured out of the receiver, the salt which remains adhering to its sides, is to be washed out with a little water and added to the rest. It is convenient to let the whole stand for a few hours, that the oil may the better disengage itself from the liquor, so as to be at first separated by a funnel, and afterwards more perfectly by filtration through wet paper.

None of these products, except perhaps a small quantity of the water, exist ready formed in the matter subjected to the distillation, but are produced by a new arrangement of its constituents. For the production of ammonia, it is absolutely necessary that it contain nitrogen, or be what is called a quaternary oxyd. Although some vegetable, and most animal substances, are of this kind, yet only the most solid parts of animals, such as bone and horn, are employed for the production of ammonia; because they furnish it less mixed with other substances, are easily obtained, and at little expense, and are very manageable in the distillation. On the application of heat, as soon as all the water which they contained is expelled, their elements begin to act on each other, and to form binary, or at most ternary compounds. Water is formed of part of the oxygen and hydrogen, ammonia of nitrogen and hydrogen, carbonic acid of carbon and oxygen, then oil, of hydrogen and charcoal, while the superfluous carbon remains in the retort in the state of charcoal. As the formation of these substances is simultaneous, or in immediate succession, they are not obtained separately, but are mixed with each other. The water is saturated with carbonat of ammonia, and impregnated with empyreumatic oil, while the carbonat of ammonia is discoloured with oil; and the oil contains carbonat of ammonia dissolved in it. They may, however, be separated from each other in a great measure, in the manner already described. But a small portion of oil obstinately adheres both to the salts and its solution, which constitutes the only difference between salt and spirit of hartshorn, as they are called, and the purer carbonat of ammonia, as obtained by the decomposition of muriat of ammonia.

In the large way, this impure preparation may answer to form muriat of ammonia.

Ammoniæ Acetas Liquidus. *A.* *Liquid Acetat of Ammonia.*

Aqua Acetatis Ammoniæ, *E. D.* Liquor Ammoniæ Acetatis. *L.*

Water, or Solution of Acetat of Ammonia. Spirit of Mindererus.

Take of

Carbonat of ammonia, in powder, any quantity.

Add, by small portions, with frequent agitation, so much purified, or distilled vinegar, as shall be sufficient exactly to saturate the carbonat of ammonia.

This is the Edinburgh formula, under a new name; but not, I think, an improved one. Of all the salts we are acquainted with, this is one of the most difficult to obtain crystallized, nor is it ever attempted, except as an experiment. Our present name would imply that the reverse was true. It is, in fine, a new appellation, without one single commensurate benefit for a change of nomenclature. In truth, we apprehend, that this is much better recommended as an extemporaneous prescription, than as a permanent article to be kept on the shelves of the apothecary. It is, like other acetats in solution, liable to decomposition; and few persons will throw it away, even if spoilt, to form a fresh supply.

By this process we obtain acetat of ammonia, dissolved in the water of the acetic acid; but as this is apt to vary in quantity, the solution also varies in strength, and the crystallization of the salt is attended with too much difficulty to be practiced for pharmaceutical purposes. Its crystals are long, slender, and flatted, of a pearly white colour, and of a cool sweetish taste, are very deliquescent, melt at 170°, and sublime at 250°. It is decomposed by the acids, alkalies, and several of the earths, and metalline salts; and when in solution, its acid is decomposed spontaneously, and by heat.

Different proposals have been made to get a solution of greater strength and uniformity, than that still retained by the British colleges. Mr. Lowe saturates four ounces of carbonat of potass with distilled vinegar, and evaporates the solution to 36 ounces. He then mixes it with two ounces of muriat of ammonia, and distils the mixture in a glass retort. Acetat of ammonia comes over. The last edition of the Prussian Pharmacopœia prepares it by saturating three ounces of carbonat of ammonia with a strong acetic acid, (obtained by distillation from acetat of soda, dissolved in two parts of water, and decomposed by sulphuric acid), and diluting the solution with water, so that it shall weigh twenty-four ounces. One ounce, therefore, contains the alkali of a drachm of carbonat of ammonia.

Incompatible substances.—Acids, fixed alkalies, alum, lime-water, the sulphats of magnesia, zinc, copper, and iron, nitrat of silver, corrosive sublimate.

Medical use.—Acetat of ammonia, when assisted by a warm regimen, proves an excellent and powerful sudorific; and as it operates without quickening the circulation or increasing the heat of the

body, it is admissible in febrile and inflammatory diseases, in which the use of stimulating sudorifics are attended with danger. Its action may likewise be determined to the kidneys, by walking about in the cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention.

This medicine may be made very readily and extemporaneously, by adding the acetic acid to the carbonat in a phial; by corking it, the carbonic acid is prevented from escaping; it unites in consequence of the pressure, with the acetat of ammonia, and forms a much more pleasant mixture.

It is often very improperly prepared by apothecaries, with common impure vinegar. The article is very unpleasant to many stomachs.

AMMONIÆ HYDROSULPHURETUM. *A.*

Hydrosulphuretum Ammoniæ. *E. D. Hydrosulphuret of Ammonia. Hydrosulphat of Ammonia.*

Take of

Water of ammonia, ... four fluid ounces;

Subject it in a chemical apparatus to a steam of the gas, which arises from

Sulphuret of antimony, . . . four ounces;

Muriatic acid, ... eight ounces, previously diluted with two pints and a half of water.

Preserve the product in a close stopped glass vessel.

Except in using sulphuret of antimony which the French have long employed, instead of sulphuret of iron, the above formula is that which is given by the Edinburgh college.

Sulphureted hydrogen, or hydrosulphuric acid, is capable of combining with different bases. In the present preparation it is combined with ammonia. It is obtained by decomposing a sulphuret, as of iron, with muriatic acid. As soon as the acid, by its superior affinity, separates the iron from the sulphur, the latter immediately re-acts on the water, the oxygen of which forms with one portion of it sulphuric acid, while the hydrogen dissolves another portion, and forms sulphureted hydrogen gas. The combination of this with ammonia is facilitated by reduction of temperature, and by making it pass through a column of the water of ammonia by means of an apparatus, such as Woulfe's or Nooth's. The ammonia very readily assumes a greenish yellow colour, from the absorption of the sulphureted hydrogen. Tromsdorff has proposed, that the sulphureted hydrogen gas should be obtained by the decomposition of sulphuret of potass; but in this way its formation is too rapid to be easily managed. Göttling says, that the acid should be added gradually, and that the whole must be constantly agitated. But these precautions are rendered unnecessary, by diluting the acid in the degree

directed by the Pharmacopœia. Mr. Cruickshank, who first suggested the use of hydrosulphuret of ammonia in medicine, directs the sulphuret of iron to be prepared by heating a bar of iron to a white heat in a smith's forge, and rubbing it against the end of a roll of sulphur. The iron at this temperature immediately combines with the sulphur, and forms globules of sulphureted iron, which should be received in a vessel filled with water.

The above remarks may be useful, as sulphuret of antimony may not be always at hand. An easy mode of preparing the sulphuret of iron is given in the Edinburgh Pharmacopœia, as an accompaniment to the old process for the remedy we are considering, viz.

Sulphuret of Iron. *E.*

Take of
Purified filings of iron, . . . three parts;
Sublimed sulphur, ... one part.
Mix and expose them to a moderate degree of heat, in a covered crucible, until they unite in a mass.

Medical use.—Hydrosulphuret of ammonia, or more correctly, sulphureted hydroguret of ammonia, acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. According to the doctrine of the chemical physiologists, it is a powerful disoxygenizing remedy. It has only been used in diabetes by Dr. Rollo and others, under the name of hepatized ammonia, in doses of five or ten drops twice or thrice a day.

The Dublin college have given a process for preparing the

Aqua Sulphureti Ammoniæ. *D.* *Water of Sulphuret of Ammonia.*

Take of
Fresh burnt lime,
Muriat of ammonia, in powder, each, . . . four ounces;
Sublimed sulphur,
Warm water, each, ... two ounces by weight.
Sprinkle the water upon the lime, placed in an earthen vessel, and cover it up until the lime falls to powder, which, as soon as it is cold, is to be mixed by trituration with the sulphur and muriat of ammonia. Put the mixture into a retort, and distil with a sudden and sufficiently strong degree of heat. Keep the liquor thus obtained in a phial, accurately closed with a glass stopper.

The product is, in fact, very little different from the former. The results of both may be regarded as the same.* In the former, the

* This last contains, it is asserted, a portion of uncombined alkali, to which it owes its fuming property, but which is speedily lost, if not kept accurately. It is decomposed by all acids, and most metallic solutions.

sulphureted hydrogen and ammonia, are presented to each other in a fully formed state. In this, they meet each other in a nascent state. This is the *fuming liquor* of Boyle; and by the French, is called, (in conformity to this view of sulphureted hydrogen being an acid), *sulphureted hydrosulphat of ammonia.*

The theory of this process is laid down by Orfila. See *Practical Chemistry*, p. 105.

Tinctura Ammoniata Aromatica. *A. E.*

Ammoniated Aromatic Tincture.

Spiritus Ammoniæ Aromaticus. *D. L.*

Aromatic Ammoniated Tincture. Aromatic Spirit of Ammonia.

Spiritus Ammoniæ Compositus. Spiritus Volat. Aromaticus.

Take of
- Ammoniated alcohol, . . . half a pint;
- Oil of rosemary, ... one fluid drachm and a half.
- Oil of sassafras, ... one fluid drachm.

Mix them that the oils may be dissolved.

The United States' Pharmacopœia employ the oil of sassafras, instead of that of lemon peel; in every other particular, the formula resembles that of Edinburgh.

Medicines of this kind may be prepared extemporaneously, by dropping any proper volatile oil into ammoniated alcohol, which will readily dissolve the oil, if the ammonia in the solvent be caustic; for, if it be carbonated, such as it was when prepared according to the former directions of the London college, it does not dissolve the oils here ordered, and is therefore totally unfit for this preparation.

Mr. Phillips says, that the oils as imported are commonly adulterated with fixed oil, which renders the aromatic spirit coloured and turbid, and that it is therefore the usual practice of chemists to distil the mixture of oils and spirit.

Medical use.—Ammonia, thus united with aromatics, is not only more agreeable in flavour, but likewise more acceptable to the stomach, and less acrimonious, than when uncombined. The dose is from five to six drops to sixty or more.

Tinctura Ammoniata Assafoetidæ. *E.*

Spiritus Ammoniæ Fœtidus. *L. D.*

Ammoniated Tincture of Assafœtida. Fœtid Spirit of Ammonia.

Alcohol Ammoniatum Fœtidum.

Take of
- Ammoniated alcohol, . . . eight ounces
- Assafœtida, ... half an ounce.

Digest in a close vessel twelve hours; then distil off, with the heat of boiling water, eight ounces. *E.*

This spirit, which is easily prepared, is designed as an anti-hysteric, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these purposes with different fetids, have been usually kept in the shops; the ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping.

It is not very evident why the different Pharmacopœias order this to be distilled. The process is at best unnecessary: our own Pharmacopœia has rejected the preparation. It is, however, an excellent remedy, and might be employed with advantage to form some of the ammoniated tinctures. Its dose is the same as the preceding.

AMMONIACUM. *A. L. D. E.* *Gum Ammoniac.*

Ammoniacum is a concrete, gummy-resinous juice, brought from the East Indies, usually in large masses, composed of little lumps or tears, of a milky colour, but soon changing, upon being exposed to the air, to a yellowish hue.

Gum-ammoniac is now referred by the London College, on the authority of Willdenow, to the *Heracleum gummiferum*, which he raised from seeds taken out of the Ammoniacum of the shops; and which, he is satisfied, is the plant which yields it, although he has not been able to procure it from the plants raised at Berlin.

This plant is depicted in the *Flora Berolinensis*, and the question of its origin might be decided by comparing it with the figure given by Mr. Jackson in his account of the Empire of Morocco, who was perfectly familiar with it.

He gives the following account of it: " *Ammoniacum*, called *Feshook* in Arabic, is produced from a plant similar to the European fennel, but much larger. In most of the plains of the interior, and particularly about El Araiche and M'sharrah Rummillah, it grows ten feet high. The gum ammoniac is procured by incisions in the branches, which, when pricked, emit a lacteous glutinous juice, which being hardened by the heat of the sun, falls on the ground, and mixes with the red earth below; hence the reason that gum ammoniac of Barbary does not suit the London market. It might, however, with a little trouble, be procured perfectly pure; but when a prejudice is once established against any particular article, it is difficult to efface it. The gum, in the above-mentioned state, is used in all parts of the country, for cataplasms and fumigations. The sandy light soil which produces the gum ammoniac, abounds in the north of Morocco. It is remarkable that neither bird nor beast is seen where this plant grows, the vulture only excepted. It is, however, attacked by a beetle, having a long horn proceeding from its nose, with which it perforates the plant, and makes the incisions whence the gum oozes out."

Ammoniacum has a nauseous sweet taste, followed by a bitter one; and a peculiar smell, somewhat like that of galbanum, but more grateful: it softens in the mouth, and acquires a white colour upon being chewed. It softens by heat, but is not fusible; when thrown upon live coals, it burns away in flame: it is in some degree soluble in water and in vinegar, with which it assumes the appearance of milk: but the resinous part, amounting to about one-half, subsides on standing.

Such tears as are large, white, dry, free from small stones, seeds, or other impurities, should be picked out and preferred for internal use; the coarser kind is purified by solution, colature, and careful inspissation; but unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts.

There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue.

Neumann extracted from 480 parts, 360 by alcohol, and then by water 105; by water applied first 410, and then by alcohol 60. Alcohol distilled from it arose unchanged, but water acquired a sweetish taste, and the smell of the ammoniac. More modern chemists say that the spirit drawn from it by distillation smelt strongly of the gum, and that a small portion of a very pungent strong smelling oil could be got from it. The solution in alcohol is transparent; but on the addition of water, becomes milky. It therefore seems to consist principally of a substance soluble both in water and in alcohol, combined with some volatile matter. Braconnot makes it consist of 700 resin, 184 gum, 44 gluten, and 60 water.

Medical use.—The general action of gum-ammoniac is stimulant. On many occasions, in doses of from ten to thirty grains, it proves a valuable antispasmodic, deobstruent, or expectorant. In large doses it purges gently, excites perspiration, and increases the flow of urine. It is used with advantage to promote expectoration in some pulmonary diseases; in dropsical affections, to augment the flow of urine, and to support the salivation of small-pox. It is also an useful deobstruent; and is frequently prescribed for removing obstructions of the abdominal viscera, and in hysterical disorders occasioned by a deficiency of the menstrual evacuations. In long and obstinate colics, proceeding from viscid matter lodged in the intestines, this gummy-resin has produced happy effects, after purges and the common carminatives had been used in vain. Externally, it is supposed to soften and ripen hard tumors. A solution of it in vinegar has been recommended by some for resolving even scirrhous swellings.

It is exhibited internally,

a. In solution, combined with vinegar, vinegar of squills, assafœtida, &c.
b. In pills, with bitter extracts, myrrh, assafœtida.
c. And externally, combined with vinegar, turpentine, common plaster, &c.

If rubbed with camphor, a mass is produced very suitable for pills, and vinegar renders it soft and fit for plasters.

CARDAMOMUM. *Cardamom. A.*

AMOMUM CARDAMOMUM. *D.* AMOMUM REPENS. *E.*

ELETTARIA CARDAMOMUM. *L.* *Lesser Cardamom.* *The Seeds.*

Both of the species of amomum are natives of India. The Edinburgh College, on the authority of Sonnerat, (in which the United States' Pharmacopœia follows,) has supposed these seeds to be the product of the *repens*, while the Dublin College, with Murray, Willdenow, and all the foreign pharmaceutical writers, ascribe them to the *Cardamomum;* and, to increase the confusion, the London College have referred this last to a new series; the reason for which is thus stated by Dr. Powell: "From an accurate description of the plant producing this valuable aromatic (lesser cardamoms) communicated to the Linnæan Society by Mr. White, surgeon, Madrass, (who, following the example of the other botanical writers, improperly refers it to the genus *amomum,*) it has been thought necessary to place the cardamom under a new genus, which Dr. Maton has named *Elettaria,* from the appellation of *Elettari,* originally given to this tribe by Van Reede, in his *hortus malabaricus.*"

As this has not as yet received the sanction of the other Colleges, it is deemed most prudent still to retain it in its former place until its situation is definitively settled.

Cardamom seeds are a very warm, grateful, pungent aromatic, and frequently employed as such in practice: they are said to have this advantage, that notwithstanding their pungency, they do not, like those of the pepper kind, immoderately heat or inflame the bowels. Both water and rectified spirit extract their virtues by infusion, and elevate them in distillation; with this difference, that the tincture and distilled spirit are considerably more grateful than the infusion and distilled water: the watery infusion appears turbid and mucilaginous; the tincture limpid and transparent. From 480 parts Neumann got about 20 of volatile oil, 15 of resinous extract, and 45 of watery. The husks of the seeds, which have very little smell or taste, may be commodiously separated, by committing the whole to the mortar, when the seeds will readily pulverize, so as to be freed from the shell by the sieve: this should not be done till just before using them; for if kept without the husks, they soon lose a considerable portion of their flavour.

Medical use.—They are carminative and stomachic, and are grateful additions to bitter infusions. Dose of the powder, five to twenty grains.

AMOMUM ZEDOARIA. *D.* *Long Zedoary.* *The root.*

The Zedoary is perennial, and grows in Ceylon and Malabar. The roots come to us in pieces, some inches in length, and about a finger

thick. Externally they are wrinkled, and of an ash-grey colour, but internally are brownish red. The best kind comes from Ceylon, and should be firm, heavy, of a dark colour within, and neither worm-eaten nor very fibrous. It has an agreeable fragrant smell, and a warm, bitterish, aromatic taste.

In distillation with water, it yields an essential oil, heavier than water, possessing the smell and flavour of the zedoary in an eminent degree; the remaining decoction is almost simply bitter. Spirit likewise brings over some small share of its flavour: nevertheless the spirituous extract is considerably more grateful than the zedoary itself From 7680 parts Neumann got 2720 of watery extract, and afterwards 140 of almost insipid resin; by applying alcohol first, 720, and water afterwards, 2400, much bitterer than the original watery extract.

ZINGIBER. *Ginger. A.*

AMOMUM ZINGIBER. *E. D.* ZINGIBER OFFICINALE. *L.*

Ginger. The dried Root. Preserved Ginger.

In the botanical arrangement of the well-known plant which produces the Ginger, the London College have followed Mr. Roscoe of Liverpool, who has given a new classification of the Scitamineous plants in the eighth volume of the Linnæan Society, in which he has separated the zingiber from the cardamom. "It has been well remarked by Jussieu," says Mr. Roscoe, "that the *zingibers* flower in a dense spike near to the stem; the *cardamoms* in a lax panicle in the base of the stem. Such an uniform natural distinction in the habit of these plants, gave great reason to suppose that, by a closer examination, sufficient generic distinctions would be ascertained. This expectation has been fully confirmed. In the plants of the ginger tribe, it appears that the anthera-bearing filament is extended beyond the anthera, and terminates in an awl-shaped appendage, with a groove or furrow to receive the style after it has passed between the lobes of the anthera, and which terminates with the stigma, a little beyond the extremity of the filament; but in the plants of the cardamom, or proper amomum tribe, the anthera-bearing filament terminates in an appendage of three or more lobes, and differs also in other respects."

Ginger is a perennial plant, indigenous in the East Indies, but now cultivated in the West India islands. It is cultivated there very much in the same manner as potatoes are here, and is fit for digging once a-year, unless for preserving in syrup, when it should be dug at the end of three or four months, at which time it is tender and full of sap.

Ginger is distinguished into two sorts, the black and the white. The former is rendered fit for preservation by means of boiling water, the latter by insolation; and as it is necessary to select the fairest and roundest sorts for exposure to the sun, white ginger is commonly one-third dearer than black.

Black ginger consists of thick and knotty roots, internally of an orange or brownish colour, externally of a yellow-grey. White ginger is less thick and knotty, internally of a reddish-yellow, and externally of a whitish-grey or yellow. It is firm and resinous, and more pungent than the black. Pieces which are worm-eaten, light, friable, or soft, and very fibrous, are to be rejected.

Preserved ginger should be prepared in India from the young and succulent roots. When genuine, it is almost transparent. That manufactured in Europe is opaque and fibrous.

Ginger has a fragrant smell, and a hot, biting, aromatic taste. Neumann obtained by distillation with water from 7680 parts of white ginger, about 60 of a volatile oil, having the smell and distinguishing flavour of the ginger, but none of its pungency. The watery extract was considerably pungent, and amounted to 2720, after which alcohol extracted 192 of a very pungent resin. Alcohol applied first extracted 660 of pungent resin, and water afterwards 2160 of a mucilaginous extract, with little taste, and difficultly exsiccated. The black ginger contained less soluble matter than the white.

Medical use.—Ginger is a very useful spice in cold flatulent colics, and in laxity and debility of the intestines; it does not heat so much as the peppers, but its effects are more durable. It may also be applied externally as a rubefacient. Lately, the powder of ginger, taken in very large doses in milk, was supposed to be almost specific in the gout.

Ginger Beer. A popular beverage in England, and lately introduced amongst us, is made as follows:

Take of
Lump sugar, ... half a pound;
Cream of tartar, ... half an ounce;
Bruised ginger, ... one ounce;
Boiling water, ... one gallon.
Ferment for twenty-four hours, with yeast.

Ginger Beer Powders.

White sugar, ... one drachm and two scruples;
Ginger, ... five grains;
Subcarbonat of soda, . . . twenty-six grains.
In each *blue paper.*
Tartaric acid, ... thirty grains, in each *white paper.*
These proportions are directed for half a pint of water.

AMYGDALA. *ALMOND.* *A.*

AMYGDALÆ DULCES. *L. D.* AMYGDALÆ AMARÆ. *L.*

AMYGDALUS COMMUNIS. *E.*

Sweet and Bitter Almonds. Varieties of the Amygdalus Communis. Kernel of the Fruit, and the Oil.

Which of these is intended by our national Pharmacopœia, under the name of "Amygdala," is not stated. As it is, it is certainly optional to take either.

The almond tree nearly resembles the peach. It originally came from Syria and Barbary; but is now much cultivated in the south of Europe.

The eye distinguishes no difference betwixt the trees which produce the sweet and bitter, or betwixt the kernels themselves; it is said that the same tree has, by a difference of culture, afforded both.

The almond is a flattish kernel, of a white colour, and of a soft sweet taste, or a disagreeable bitter one. The skins of both sorts are thin, brownish, unpleasant, and covered with an acrid powdery substance. They are very apt to become rancid on keeping, and to be preyed on by a kind of insect, which eats out the internal part, leaving the almond to appearance entire. To these circumstances regard ought to be had in the choice of them.

Sweet almonds are of greater use in food than as a medicine, but they are reckoned to afford little nourishment: and when eaten in substance, are not easy of digestion, unless thoroughly comminuted. They are supposed, on account of their unctuous quality, to obtund acrimonious juices in the primæ viæ: peeled sweet almonds, eaten six or eight at a time, sometimes give present relief in the heartburn.

Boullay has lately confirmed the analogy which Proust had stated to exist between the emulsion of *sweet* almonds and human milk, viz. the former consists of oil 54, albumen 24, sugar 6, gum 3, with traces of acetic acid; the indigestible property of the almond depends upon its albuminous matter.

The *bitter almond*, in addition to those constituents, contains hydro-cyanic (prussic) acid, in union with a peculiar volatile oil, upon which its narcotic properties depend;* the leaves of the peach tree, the pips of apples and the kernels of many fruits, particularly of those which have the flavour of bitter almonds, all contain prussic acid. That *peculiar* odour of the peach

* *Noyau, crème de noyau*, a liquor of a very agreeable nature, but not devoid of danger; the late Duke Charles, of Lorraine, nearly lost his life from swallowing some "*eau de noyau*," (water distilled from peach kernels) too strongly impregnated. *Noyau* is made thus: Bitter almonds blanched, one ounce; proof spirit, half a pound: sugar, four ounces. It is sometimes coloured with cochineal.

blossom or bitter almond, is characteristic of the presence of prussic acid.

It is said to be in the thin pellicle which envelops the kernel, that it is most abundantly formed. The fleshy parts of the fruit do not contain it; and even the berries of the *Lauro Cerasus* may be eaten with impunity; yet the distilled water and oil of *cherry laurel* are the most destructive of all narcotic poisons.*

The watery extract of laurel is harmless, since this acid is volatilized before the fluid can assume the state of extract. For further remarks on prussic acid, vide *Cyanogen*.

Both sorts of almonds yield, on expression, a large quantity of oil, which separates likewise upon boiling the almonds in water, and is gradually collected on the surface.

The oils obtained by expression from both sorts of almonds are in their sensible qualities the same. They should be perfectly free from smell and taste, and possess the other properties of fixed oils.

Medical use.—The general virtues of these oils are, to blunt acrimonious humours, and to soften and relax the solids: hence their use internally, in tickling coughs, heat of urine, pains and inflammations; and externally, in tension and rigidity of particular parts. On triturating almonds with water, the oil and water unite together, by the mediation of the other matter of the kernel, and form an unctuous milky liquor.

The milky solutions of almonds in watery liquors, commonly called emulsions, contain the oil of the subject, and participate in some degree of its emollient virtue; but have this advantage above the pure oil, that they may be given in acute or inflammatory disorders, without danger of the ill effects which the oil might sometimes produce; since emulsions do not turn rancid or acrimonious by heat, as all the oils of this kind in a little time do. As the bitter almond imparts its peculiar taste when treated in this way, the sweet almonds are employed in making emulsions.

Several unctuous and resinous substances, of themselves not miscible with water, may, by trituration with almonds, be easily mixed with it in the form of an emulsion; and are thus excellently fitted for medicinal use. In this form, camphor, and the resinous purgatives, may be commodiously taken.

* Although this fact was long known, it was not until within a few years, that the identity of this destructive principle, and prussic acid, was fully proved.

In the year 1782, Dr. Price, of Guilford, professed to convert mercury into gold, and his experiments were to be repeated before an adequate tribunal; but he put a period to his existence, by swallowing laurel water, &c.

AMYLUM. (*See Triticum.*)

AMYRIS ELEMIFERA. *L. D. The Resin called Elemi.*

The tree which furnishes elemi grows in Carolina and Spanish America. In dry weather, and especially at full moon, incisions are made in the bark, from which a resinous juice flows, and is left to harden in the sun. It is brought to us in long roundish cakes, generally wrapped up in flag leaves. The best sort is softish, somewhat transparent, of a pale whitish yellow colour, inclining a little to green, of a strong not unpleasant smell, resembling somewhat that of fennel. Dr. Wright says, that on wounding the bursera gummifera, a thick milky liquor flows, which soon concretes into a resin no way different from the elemi of the shops. Of 100 parts 94 dissolve in alcohol, and part of its fragrance rises along with this menstruum in distillation : distilled with water it yields 6.4 of pale-coloured, thin, fragrant, essential oil. Its only constituents, therefore, are resin and essential oil. It gives name to one of the officinal unguents, and is at present scarce any otherwise made use of; though it is certainly preferable for internal purposes to some others which are held in greater esteem.

AMYRIS GILEADENSIS. *E.*

Balsam of Gilead. A Liquid Resin.

This substance, which has also had the name of Balsamum Judiacum, Syriacum, de Mecca, Opo-balsamum, &c. is a resinous juice, obtained from an evergreen tree, growing spontaneously, particularly near to Mecca, on the Asiatic side of the Red Sea. The best sort of it is a spontaneous exudation from the tree ; and is held in so high esteem by the Turks, who are in possession of the country where it is produced, that it is rarely, if ever, to be met with genuine among us. From the high price set upon it, many adulterations are practised. The true opo-balsamum, according to Alpinus, is at first turbid and white, of a very strong pungent smell, like that of turpentine, but much sweeter ; and of a bitter, acrid, astringent taste : upon being kept for some time, it becomes thin, limpid, of a greenish hue, then of a gold yellow, and at length of the colour of honey.

This balsam is in high esteem among the eastern nations, both as a medicine, and as an odoriferous unguent and cosmetic. It has been recommended in a variety of complaints. But in Europe it is never obtained genuine; and as all the signs of its goodness are fallacious, it has been very rarely employed. Nor need we regret it; for any of the other resinous fluids, such as the balsam of Canada or Copaiba will answer every purpose full as well.

ANCHUSA TINCTORIA. *E.*

ANCHUSA. *D. Alkanet. False Alkanet. The Root.*

This plant is a native of Europe: it is sometimes cultivated in gardens; but the greatest quantities are raised in Germany and France, particularly about Montpelier, from whence the dried roots are usually imported to us. The alkanet root produced in England is much inferior in colour to that brought from abroad; the English being only lightly reddish, the others of a deep purplish red; and it has been suspected, but without sufficient foundation, that the foreign roots owe part of their colour to art. The cortical part of the root is of a dusky red, and imparts an elegant deep red to alcohol, oils, wax, and all unctuous substances, but not to watery liquors.

Alkanet root has but little or no smell; when recent, it has a bitterish astringent taste; but when dried, scarcely any. As to its virtues, the present practice expects not any from it. Its chief use is for colouring oils, ointments, and plasters. As the colour is confined to the cortical parts, the small roots are best, having proportionally more bark than the large.

According to John, of Berlin, the colouring matter is a peculiar substance, soluble in alcohol, ether, and oils; not soluble in water; infusible, and not precipitated from alcohol by water as resins are. He calls it *Pseudo-Alcannin,* to distinguish it from the unexamined colouring matter of the real alkanet, furnished by the Lawsonia Inermis, a native of India, Syria, and Egypt.

ANDROMEDA MARIANA. *Broad-leaved Moor-wort.*

Decandria Monogynia. Nuttall.

The different species of the andromeda are very nearly akin in botanical charactor to the rhododendron and kalmia, and are suspected by the late professor Barton to be poisonous. A decoction of the plant under consideration has been successfully employed as a wash, in a disagreeable ulceration of the feet, which is not uncommon among the slaves, &c. in the southern states, and which is known by the name of the toe-itch and ground-itch.

The brown powder attached to the foot-stalks of the leaves of the andromeda, is considerably errhine. The powder about the seeds, in the seed-vessels, possesses a similar quality.*

* Barton's collection towards a Materia Medica, part 1st.

ANETHUM GRAVEOLENS. *L. Dill. The Seed.*

Dill is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatic, but not of the most agreeable kind. These seeds are recommended as a carminative in flatulent colics. The most efficacious preparation of them, are the distilled oil, and a tincture or extract made with rectified spirit.

ANETHUM FŒNICULUM. *E. L. D.* FŒNICULUM. *A.*

Sweet Fennel. The Root and Seed.

This is a biennial plant, of which there are four varieties. The sweet fennel grows wild in Italy; but is cultivated in gardens in England. It is smaller in all its parts than the common, except the seeds, which are considerably larger. The seeds of the two sorts differ likewise in shape and colour: those of the common are roundish, oblong, flattish on one side, and protuberant on the other, of a dark almost blackish colour; those of the sweet are longer, narrower, not so flat, generally crooked, and of a whitish or pale yellowish colour.

The seeds of both the fennels have an aromatic smell, and a moderately warm, pungent taste: those of the *fœniculum dulce* are in flavour most agreeable, and have also a considerable degree of sweetness.

From 960 parts, Neumann obtained 20 of volatile oil, 260 of watery extract, and afterwards some alcoholic extract, which could not be exsiccated on account of its oiliness. By alcohol first, he got 84 resinous extract, 120 fixed oil, and then by water 129 of a bitter extract.

ANGELICA ARCHANGELICA. *E. Angelica. The Root.*

Angelica is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in Alpine countries; but for the use of the shops, it is cultivated in gardens in different parts of Europe.

All the parts of angelica, especially the roots, have a fragrant aromatic smell; and a pleasant bitterish warm taste, glowing upon the lips and palate for a long time after they have been chewed.

The flavour of the seeds and leaves is very perishable; particularly that of the latter, which, on being barely dried, lose the greater part of their taste and smell: the roots are more tenacious of their flavour, though they lose part of it with keeping. The fresh root, wounded early in the spring, yields an odorous yellow juice; which, slowly exsiccated, proves an elegant gummy resin, very rich in the virtues of the angelica. On drying the root, this juice concretes into distinct moleculæ, which, on cutting it longitudinally appear distributed in little veins; in this state, they are extracted by alcohol, but not by watery liquors. Angelica roots are apt to grow mouldy, and to be preyed on by insects, unless thoroughly dried, kept in a dry place, and frequently aired. We apprehend, that the roots which are subject to this inconvenience, might be preserved by dipping them in boiling spirit, or exposing them to its steam, after they are dried. Baumé says that it is only the roots gathered in the spring that are subject to this inconvenience, and that when gathered in the autumn, they keep good several years. Roots only worm-eaten are as fit as ever for making a tincture, or affording volatile oil.

Angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice. The root, which is the most efficacious part, is used in the aromatic tincture. The stalks make an agreeable sweetmeat.

John analyzed the dried angelica root, and proved that it owed its peculiar properties to a considerable proportion of essential oil, and acrid resin. It also contained much gum and some inulin.

ANGELICA ATROPURPUREA. *A. Angelica. The Plant.*

Although placed on the secondary list of the United States' Pharmacopœia, it is trusted that the example of the London and Dublin Colleges, who have rejected from their lists of medicinal articles the preceding species, will influence those who may have the revision of our own Pharmacopœia, to act towards this in the same way.

ANGUSTURA. *A. D.* Cusparia Febrifuga. *L.*

Bonplandia Trifoliata. *E. Angustura Bark.*

The natural history of this bark was long but imperfectly known. The first portion of it was imported from Dominica to England, in 1788, with an account, "that it had been found superior to the Peruvian bark in the cure of fevers." Subsequent importations from the Spanish West Indies, either immediately or through the medium of Spain, gave reason to suppose, that it was the produce of

South America. This has been fully established by the late travels of Humboldt in that country. He gave to Willdenow a dried specimen of the tree of which it is the bark, and that eminent botanist discovered it to be a new genus, to which he gave the name of Bonplandia, in honour of the botanical companion of Humboldt's travels.

The London College, however, give this tree the name of Cusparia Febrifuga, derived from *Cuspa*, the native appellation of the tree; but this name must be abandoned, for although it was inserted by Humboldt in the chart belonging to his geography of plants; that of Bonplandia Trifoliata is adopted by him in his Plantæ Æquinoctiales. The name Angustura bark is derived from the Spanish denomination, *cascarilla*, or *corteza del Angustura*, which is the vulgar name of the town of St. Thomas, near the Straits of the Oronoco, where it forms a considerable article of commerce.

The appearance of the bark varies, according as it has been taken from larger or smaller branches. It is only one or two lines in thickness, and is sometimes cracked externally. The outer surface is more or less wrinkled, and of a greyish colour, and the inner surface is of a dull dark brown. The bark of the younger branches is of a fine green colour, dotted with greyish tubercles. Its substance is of a yellowish brown colour. Its fracture is short and resinous. Its taste is intensely bitter, and slightly aromatic, leaving a strong sense of heat and pungency in the throat and fauces. The odour is peculiar. The powder is yellow.

According to the experiments related by Mr. Brande, from 3840 parts of angustura, there were extracted by alcohol, 144 of resin, and 300 of an acrid unctuous substance, the residuum yielded to water 1500 of dry gummy extract. Treated first with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards 161 of a resin of a light brown colour, and extremely acrid. By distillation it gave 26 of essential oil. The tincture is of a deep yellow colour, and reddens infusion of turnsole, and becomes turbid and white on admixture with water. By repeated filtration a brownish resin is separated, and the transparent fluid has a pale yellow colour. It is not precipitated by solution of gelatin, but by infusion of galls. It therefore does not contain tannin but cinchonin, and it has the peculiar property of acquiring a deep red colour with red sulphat of iron, and depositing a purplish slate-coloured precipitate.

Dr. Rambach, of Hamburgh, first observed poisonous effects from some Angustura bark, and his observations have been fully confirmed by other accidents and by experiments on animals. The Austrian government, on this account, ordered all the Angustura bark in the kingdom to be destroyed, and interdicted its future importation. Other states have followed its example. It still has a place in the British Pharmacopœias, and is now introduced into that of the United States. It becomes necessary, therefore, to point out fully

the means of distinguishing the genuine from the spurious sort, which Planche has called *Angustura Pseudo-ferrugincea.*

Genuine.	*Spurious.*
The produce of the *Bonplandia trifoliata* of Humboldt, a native of South America.	Unknown. Said by some to come from the East Indies; and one kind suspected by *Planche*, but contrary to probability, to be got from a variety of the *Cinchona magnifolia* of Bonpland.
Size from ½ to ¾ of an inch broad; 2, 3, or 4 inches long; half a line thick. Outer surface uniform greyish-white, as if covered with an uneven mealy coat, which is easily removed, and exposes a brown surface beneath. Inner surface greyish-yellow, or light-brown. Texture fine; very brittle. Fracture even; much darker and browner than the inner surface; somewhat shining, and evidently resinous.	Size generally of greater breadth than length; two lines thick. Outer surface covered with a web of distinct small white warts, not easily removed, or with an uniform rust-coloured lichen-like covering. Inner surface, dirty yellowish-white, or grey, or most commonly black, without visible fibres. Texture coarse; very brittle. Fracture even; partly white, or yellowish-white, or even clear brownish; not shining and resinous, but more mealy, and partly exhibiting two distinct layers.
Smell aromatic; somewhat nauseous.	Smell resembling somewhat that of the genuine kind.
Taste aromatic bitter, but not at all disgustingly bitter, or astringent, succeeded in some degree by an aromatic flavour like mace.	Taste in the highest degree disgustingly bitter; very durable, and not at all aromatic, or astringent.
Bark, on being chewed, becomes dark-brown yellow. Powder, when fresh, yellow, like good rhubarb, becoming paler by keeping, with a more aromatic smell than the bark.	Bark, on being chewed, becomes paler. Powder clearer yellow.
Concentrated infusion clear, of a fine reddish-brown or orange colour, and a bitter, only slightly acrid taste.	Concentrated infusion, not so clear, more of a dirty-brown colour, and of a most disgustingly bitter taste.
Diluted with water, its colour becomes yellow.	When diluted, it does not become yellow.
On the addition of an alkaline carbonat, it is changed to dark red, and after some time depo-	On the addition of an alkaline carbonat, it becomes greenish, and deposites a flocculent grey-

Genuine.	*Spurious.*
sites a clear citron yellow, somewhat flocculent precipitate.	ish-yellow precipitate, and the supernatant liquor becomes gradually dark-brown, beginning at the surface.
A solution of persulphat or permuriat of iron imparts to it a higher red colour, and after some time throws down a rose-coloured precipitate.	A solution of persulphat or permuriat of iron imparts to it a dark green colour, and soon throws down a copious satin black precipitate, verging somewhat to ash-grey, which is perfectly redissolved by nitric acid, and forms an olive solution.
Is not rendered turbid by solution of gelatin.	Is not rendered turbid by solution of gelatin.
Saturated decoction of a fine red-brown, on cooling becomes turbid, and deposites a deep-yellow powder.	Saturated decoction, brownish-yellow, and, on cooling, deposites a very copious grey-brown precipitate.
Saturated tincture, dark-red-brown, becoming very turbid by the addition of distilled water, and depositing a clear yellow resin.	Saturated tincture, much paler; and, on the addition of distilled water, only gets a pale-yellowish opaline appearance, without becoming red, or depositing any precipitate.

The spurious angustura belongs to the same class of poisons as the Faba St. Ignatii, upas tieuté, &c.

Medical use.—As an aromatic bitter, it acts as a tonic and stimulant of the organs of digestion. It increases the appetite for food, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhœa proceeding from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as cinchona is apt to do. It does not cure intermittents.

It is exhibited,

1. In powder, in doses of from 5 to 20 grains, either alone or with rhubarb, magnesia, or carbonat of lime.
2. In infusion: the infusion of one drachm in four ounces of water may be used daily.
3. In tincture: one or two drachms in dyspepsia.
4. In watery extract. Humboldt informs us, that the Catalonian Capuchins, who possess the missions of Carony, prepare with great care an extract of this bark, which they distribute to the convents of Catalonia.

For a more particular detail of its botanical history, consult the Eclectic Repertory, vol. iv. p. 155.

ANTHEMIS. *A.* ANTHEMIS NOBILIS. *E. L. D.*

Chamomile. The Flowers.

Chamomile is a perennial plant, indigenous to the south of England, but cultivated in most gardens for the purposes of medicine. The flowers have a strong, not ungrateful, aromatic smell, and a very bitter nauseous taste. These are so very generally employed in medicine, as to render their extensive cultivation in the United States well worthy of attention. The single variety is best.

Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed their antispasmodic, carminative, cordial, and diaphoretic effects; to the former their influence in promoting digestion.

Neumann obtained from 480 parts, 180 of alcoholic extract, and afterwards 120 of watery; and reversing the procedure, 240 watery, and 60 alcoholic.

Medical use.—Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, and in the after pains, in gout, in podagra, in intermittents, and in typhus.

As chamomile excites the peristaltic motion, it is useful in dysentery, but is not admissible in all cases of diarrhœa. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting, especially when given in warm infusion; and in this way it is often used to assist the action of other emetics.

Externally, chamomile flowers are applied as a discutient and emollient; in the form of clyster or embrocation, in colic, dysentery and strangulated hernia, &c.

Chamomile flowers are exhibited,

1. In substance, in the form of powder, or rather of electuary, in doses of from half a drachm to two drachms, either alone, or combined with Peruvian bark, as for the cure of intermittent fevers.

2. In infusion, in the form of tea. This may either be drunk warm, for promoting the action of emetics, or cold, as a stomachic.

3. In decoction or extract. These forms contain only the extractive, and therefore may be considered as simple bitters.

4. The essential oil may be obtained by distillation. This possesses the antispasmodic powers in a higher degree than the simple flowers, but on the contrary, does not possess the virtues depending on the presence of the bitter extractive. It is a most agreeable addition to many pills.

ANTHEMIS PYRETHRUM. *E. L. D.*

Pyrethrum. *A. Pellitory of Spain. The Root.*

This plant, though a native of warm climates, as Barbary, bears the ordinary winters of England, and often flowers successively from Christmas to May: the roots also grow larger there than those with which the shops are usually supplied from abroad. They are seldom so big as the little finger, and the best are dry, compact, of a brown colour, and not easily cut with a knife.

Pellitory root has no sensible smell; its taste is very hot and acrid, but less so than that of arum; the juice expressed from it has scarce any acrimony, nor is the root itself so pungent when fresh as after it has been dried. Neumann obtained from 960 parts of the dry root, only 40 of alcoholic extract, and afterwards 570 of watery; and by a reverse procedure, 600 of watery, and 20 of alcoholic extract. Both the alcoholic extracts were excessively pungent. Its acrimony, therefore, is derived from a resin. Johns found much inulin in the watery extract.

Medical use.—The principal use of pyrethrum in the present practice is as a masticatory, for promoting the salival flux, and evacuating the viscid humours from the head and neighbouring parts; by this means it often relieves the toothach, some kinds of pains of the head, and lethargic complaints. A vinous infusion is also useful in debility of the tongue.

ANTIMONIUM. *A.*

Antimonium. Stibium. *Antimony.*

Antimony is white, very brilliant, lamellated; specific gravity 6.702; moderately hard; pulverizable; fusible at 809°; volatile when highly ignited; sensible taste and smell; unalterable in cold air; oxydizable by air and heat; oxyd fusible into a yellow brown glass; decomposes water when ignited; oxydized by the sulphuric, and nitric acids; combines with phosphorus and sulphur. Oxyds are black, brown, orange, yellow, white; and they colour glass yellow or hyacinthine.

Antimony is found,

I. In its metallic state, at Stahlbergh in Sweden, and Allemont in France.

II. Mineralized with sulphur.

1. Grey antimony.
   a. Compact. *b.* Foliated. *c.* Striated. *d.* Plumose.
2. Red antimony.

III. Oxydized. Mongez.

IV. Acidified. 1. Muriated. 2. Phosphated.

The grey ore of antimony is the state in which it is officinal, and also that in which it is most commonly found.

Antimony is obtained from its ores by gradually detonating in a large crucible four parts of sulphureted antimony, three of crude tartar, and one and a half of dry nitrat of potass, reduced to a fine powder, and intimately mixed. The detonated mass is then to be fused and poured into a heated mould, greased with a little fat, in which it is allowed to consolidate. It is then turned out, and the scoriæ are separated from the antimony, which will weigh about one-fourth part of the sulphuret employed. The scoriæ are a mixture of sulphuret of potass and of antimony, and may be preserved for other purposes.

Another method of obtaining antimony, is by melting three parts of sulphureted antimony, with one of iron. The sulphur quits the antimony, and combines with the iron.

Antimonii Sulphuretum. *A.* Sulphuretum Antimonii. *E. L. D.*

Sulphuret of Antimony. Crude Antimony.

Although sulphuret of antimony be a natural production, yet it is commonly sold in the form of loaves, which have been separated from the stony and other impurities of the ore by fusion, and a species of filtration. For the ore is melted in conical well-baked earthen pots, having one or more small holes in their apices. The fire is applied around and above these pots; and as soon as the sulphureted antimony melts, it drops through the holes into vessels placed beneath to receive it, while the stony and other impurities remain behind. As antimony is very volatile, the mouths and joinings of the pots must be closed and luted. The upper part of the loaves thus obtained is more spungy, lighter, and impure, than the lower, which is therefore always to be preferred. These loaves have a dark grey colour externally, but on being broken, they appear to be composed of radiated striæ, of a metallic lustre, having the colour of lead. The goodness of the loaves is estimated from their compactness and weight, from the largeness and distinctness of the striæ, and from their being entirely volatilized by a red heat. Lead has been sold for antimony; but its texture is rather foliated than striated, and it is not vaporizable, nor easily powdered. The presence of arsenic, which renders the antimony useless for medical purposes, is known by its emitting the smell of garlic when thrown upon live coals, and by other tests mentioned under arsenic. The presence of manganese or iron is known by their not being volatilized by a red heat.

In composition, sulphuret of antimony consists of antimony 100, sulphur 35.572. It has been known from the time of Basil Valentine, to the present, in market, by the improper name of *antimony*, which is applicable only to the pure metal. It is now scarcely ever employed in medicine, although formerly much so. Its chief use is in the preparation of other antimonial compounds, which are at present very

limited in number, and might perhaps be still more so, without any detriment to medicine.

In estimating the comparative value of antimonial preparations in medicine, we may attend to the following observations. All the metallic preparations are uncertain, as it entirely depends on the state of the stomach, whether they act at all, or operate with dangerous violence. The sulphuret is exposed, though in a less degree, to the same objections.

The preparations in which antimony is in the state of peroxyd, are perfectly insoluble in any vegetable or animal acid, and are also found to be perfectly inert when taken into the stomach.

The remaining preparations of antimony, or those in which it is in the state of protoxyd, are readily soluble in the juices of the stomach, and act in very minute doses. Of its saline preparations, only those can be used internally which contain a vegetable acid ; for its soluble combinations with the simple acids are very acrid and corrosive. In general, the surest and best preparations of antimony are those which contain a known quantity of the metal in the state of protoxyd.

The general effects of antimonials are, in small doses, diaphoresis, nausea: in large doses, full vomiting and purging. Some allege that antimonials are of most use in fevers when they do not produce any sensible evacuation, as is said to be the case sometimes with James's powder. They therefore prefer it in typhus, and emetic tartar in synochus, in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation.

Antimonii Sulphuretum Præparatum. *A.*

Sulphuretum Antimonii Præparatum. *E. D.*

Prepared Sulphuret of Antimony.

This is to be prepared in the same way as carbonat of lime.

By reducing the sulphuret of antimony to the state of an impalpable powder, it is both rendered much more active than it would otherwise be, and it is prevented from irritating the stomach mechanically, of which there would be some danger from the sharpness of its spiculæ. Even in this state, however, it is not a very certain remedy. In general, it operates as a very mild sudorific or cathartic ; but sometimes, if it meet with much acid in the stomach, it becomes more active, producing vomiting or hypercatharsis. Therefore, it seems prudent to evacuate the primæ viæ before it be exhibited, and to combine it with an absorbent earth.

It is principally given in scrofula, glandular obstructions, cutaneous diseases and rheumatism. Its dose is from 10 to 30 grains

and upwards, and it is best exhibited in the form of a powder or bolus.

It is said to constitute a quack remedy which has acquired some reputation in Ireland, for the cure of cancer, used externally as a dressing to the sore.

Antimonii Oxydum. *A.*

Oxyd (formerly Crocus) of Antimony.

Take of
Sulphuret of antimony;
Nitrat of potass, of each equal weights.
After they are separately powdered and well mixed, let them be thrown into a red hot crucible. When the deflagration is over, separate the reddish matter from the whitish crust, and reduce it to a powder, which is to be repeatedly washed with hot water, till the water remains insipid.

This is the *Oxidum Antimonii cum Sulphure per-nitratem Potassæ*, of the former Edinburgh Pharmacopœia. It is no longer retained by that name, nor even introduced as a separate preparation. It is now found under the head of Tartras Antimonii, as the preliminary part of the process for making tartar emetic.

Why it is retained at all, being long since rejected by the London College for other more certain preparations, might be difficult to say; and it is to be regretted that it is introduced into our own national Pharmacopœia, merely for the purpose of forming the muriat of antimony, a preparation now scarcely used in medicine; and, except as an experiment, never prepared by the apothecary. The London College have selected another formula for obtaining an oxyd of antimony, which is the easier of execution, and would probably supply the place of the above impure oxyd, in every particular.

In the process abovementioned, the nitric acid of the nitre, and part of the sulphuret, are mutually decomposed; the sulphur is acidified, and combines with the potass of the nitre, while the antimony is converted into protoxyd, which combines with the undecomposed portion of the sulphuret, and forms a dark brown, opaque, vitrified mass; so that after the scoriæ and other saline matters have been removed by washing, the substance which remains, according to Proust, consists of three parts of oxyd of antimony, and one of sulphuret of antimony.

With regard to the mode of preparation, Bergmann observes, that by the common process of throwing the mixture into an ignited uncovered crucible, there is sometimes a loss of nearly one half; and therefore advises the mixture to be put into a cold crucible, which is to be covered and heated until the matter melts, by which means there is very little loss.

What is kept in the shops is almost universally prepared with less nitre than is here ordered. The consequence is, that too much sul-

phur remains not acidified, the antimony is scarcely oxydized, and the preparation is unfit for uses to which it ought to be applied. When nitre has been thus culpably economized, the crocus has a steel grey, instead of a liver brown colour.

The sulphureted oxyd of antimony is a very uncertain preparation, often operating with very great violence. Its internal use is therefore almost proscribed, or at least confined to maniacal cases, and veterinary practice.

Antimonii Oxydum. *L.* *Oxyd of Antimony.*

Take of
Tartarized antimony, ... one ounce;
Sub-carbonat of ammonia, . . . two drachms;
Distilled water, what is necessary.

Dissolve the salts separately in water, then mix the liquors, and boil until the oxyd of antimony be precipitated. Wash this with water, and dry it.

This process, which was some time since introduced by the London College as a substitute for the *numerous impure oxyds of antimony* in preceding Pharmacopœias, will furnish a very pure protoxyd of antimony, and does not seem liable to any objection.

Oxydum Antimonii Nitro-Muriaticum. *D.*

Nitro-Muriatic Oxyd of Antimony.

Take of
Prepared sulphuret of antimony, . . . two ounces;
Muriatic acid, ... eleven ounces by measure;
Nitrous acid, ... one drachm by measure.

Add the sulphuret gradually to the acids, previously mixed in a glass vessel, avoiding the vapours. Digest with a heat gradually increased, until the effervescence cease, and then boil for one hour. Filter the liquor when cold, and receive it when filtered in a gallon of water. The oxyd of antimony will fall to the bottom. Wash this repeatedly in a sufficiently large quantity of water, until the liquor poured off is perfectly free from acid, as known by the test of litmus; and, lastly, dry the oxyd upon bibulous paper.

Here, the antimony oxydized, by the nitric acid, is dissolved in the muriatic; the muriat of antimony thus formed, is decomposed by water. According to Sir H. Davy, a portion of the water furnishes oxygen to the metal, and hydrogen to the chlorine, which are thus converted into protoxyd and muriatic acid, a supermuriat remains in solution, and an insoluble submuriat precipitates in white acicular or silky crystals, formerly known under the title of *Pulvis Algarothi*, the subject of the above prescription. That it is a sub-

muriat, is proved by its yielding a small proportion of muriat on distillation, according to Bergmann. It is only used in the preparation of tartar emetic.

ANTIMONII MURIAS. *A.*

Muriat (or Butter) of Antimony. Chloride of Antimony.

Take of
Oxyd of antimony;
Sulphuric acid, of each, . . . one pound;
Dried muriat of soda, ... two pounds.

Pour the sulphuric acid into a retort, gradually adding the muriat of soda, and oxyd of antimony, previously mixed. Then perform the distillation in a sand bath. Expose the distilled matter for several days to the air, that it may deliquesce, and then pour the liquor from the feces.

Our national Pharmacopœia takes up this preparation just at the moment when all the three British Colleges have dismissed it from their lists. What particular advantage was intended to the profession by retaining it, I cannot learn. Its use is scarcely commensurate with present practice. It was long employed as a caustic, and is so now, occasionally, although a very unmanageable one. Internally it is never administered; and it might without inconvenience have been left out of our lists, in the retrenchments made.

Muriat of antimony was originally prepared by distilling sulphuret of antimony with muriat of quicksilver. Muriat of antimony, or butter of antimony, as it was called from its appearance when recently prepared, passes over into the receiver, and black sulphuret of quicksilver remains in the retort; or, by increasing the heat, red sulphuret of mercury, which, when obtained by this process, was formerly termed Cinnabar of Antimony, is sublimed. But this mode of preparation is both expensive, and dangerous to the health of the operator. To avoid these inconveniences, Scheele prepared a sulphureted oxyd of antimony, by deflagrating two parts of sulphuret of antimony with three of nitrat of potass in an iron mortar. The mass thus obtained is to be powdered, and one pound of it put into a glass vessel, on which is to be poured, first a mixture of three pounds of water and fifteen ounces of sulphuric acid, and afterwards fifteen ounces of powdered common salt. The whole is to be digested for twelve hours, and stirred all the while, and the solution, when cool, strained through linen. On the residuum, one-third of the above menstruum is to be poured, and the mixture digested and strained. Mr. Stott says, that the digestion need not be continued longer than two or three hours, and that the heat must be kept moderate, as the muriat of antimony begins to evaporate before it boils. This process furnishes an easy, if not the best, mode of preparing the submuriat of antimony, but it does not give us the solution of the muriat in a state of purity. But in consequence of its volatility, we

may easily separate it from the other salts by distillation. This was first proposed by Gmelin, and improved by Wiegleb, who distilled a mixture of one part of sulphuret of antimony, four of muriat of soda, and three of sulphuric acid diluted with two of water; but in this process, the product is rendered impure by the admixture of sulphur, and there is great danger of the vessels bursting from the immense quantity of sulphureted hydrogen gas disengaged. The Prussian Dispensatory pours upon two ounces of crocus of antimony, and six of dried muriat of soda, in a retort, four ounces of sulphuric acid, previously diluted with two ounces of distilled water, and distils. But we have already observed, that the oxyd of antimony made use of in this preparation, is seldom sufficiently oxydized or deprived of its sulphur, which occasions the production of much sulphureted hydrogen gas; and from the concentrated state in which the materials are employed, the muriatic acid gas is sometimes disengaged, especially if the heat be improperly applied, so rapidly, that it has not time to act upon the oxyd of antimony. At last, in 1797, Göttling, by substituting the glass of antimony for the crocus, diluting the sulphuric acid, and using the muriat of soda crystallized, removed these inconveniences. He introduces into a retort a mixture of four ounces of glass of antimony in powder, with sixteen of muriat of soda, and then pours into it twelve ounces of sulphuric acid, diluted with eight of water. He lutes on a tubulated receiver with gypsum, and distils to dryness in a sand bath, with a heat gradually increased. By this process, he says, about twenty ounces of very strong fuming solution of muriat of antimony are obtained. The residuum in the retort is sulphat of soda, but unfit for internal use, on account of its being mixed with some antimony.

Butter of antimony* is crystallizable. It is remarkably deliquescent, and forms a permanent solution; but if more than a certain proportion of water be added, it is decomposed, a large quantity of submuriat of antimony being precipitated, in the form of white silky crystals, while a super-muriat remains in solution. It consists, according to Mr. J. Davy, of 56 antimony, and 44 chlorine, or 1 proportion of antimony to 2 of chlorine.

ANTIMONII OXYDUM VITRIFICATUM. *A.*

Vitrified Oxyd of Antimony.

VITRUM ANTIMONII. *Glass of Antimony.*

Take of
  Sulphuret of antimony, any quantity, beat into coarse powder like sand.

Strew it upon an unglazed shallow earthen vessel, and place it over a gentle fire, that the sulphuret of antimony may be slowly heated, at the same time stirring the powder constantly, to prevent it from running into lumps. White vapours, having the odour of

* Antimonane of Sir H. Davy.

sulphur, will arise from it. When these cease with the degree of heat first applied, raise the heat a little, so that the vapours may arise again; go on in this manner, till the powder, brought to a red heat, exhales no more vapours. Melt this powder in a crucible, with an intense heat, till it assumes the appearance of melted glass; then pour it upon a heated brass plate.

The Edinburgh, like the other British Colleges, has at length rejected this old article from its catalogue of medicines, and consequently the next to be mentioned, which depended on this for its preparation. It well deserved to be retained for this purpose, if only half of the virtues ascribed to it are correctly stated in the fifth volume of the Edinburgh Medical Essays and Observations.

Glass of antimony, according to Proust, consists of one part of sulphuret of antimony, combined with eight of oxyd of antimony; now, by this process, the greatest part of the antimony is deprived of its sulphur, and is at the same time converted into the protoxyd, which combines with the small portion of sulphuret which remains undecomposed. But as this preparation is not easily made in the manner here directed, unless in a furnace constructed on purpose; apothecaries may advantageously adopt the synthetical method of Bergmann, which consists in melting in a crucible, with one twelfth or eighth of its weight of sulphur, protoxyd of antimony prepared by deflagrating it with more than twice its weight of nitre. At the temperature necessary for melting it, part of the protoxyd of antimony loses its oxygen, and is converted into sulphuret, and combines with the remaining protoxyd, in the proportions which form the glass of antimony.

In whichever way prepared, the glass of antimony is transparent, and has a fine hyacinthine colour. On dissolving it in muriatic acid, it gives out sulphureted hydrogen gas. Its medical operation is so uncertain, that it is only used in making other preparations.

A glass of lead, within a few years, was fraudulently sold in London, for this preparation.

To discover so criminal an imposition, reference may be had to the colour of the two; that of antimony being of a rich brown or reddish, with the usual transparency of coloured glasses. That of lead, is of a deeper and duller colour against the light, less transparent and sometimes quite opaque.

Specific gravity of glass of antimony never exceeds 4.95
Specific gravity of glass of lead is 6.95

or in round numbers, their comparative weights are as 5 to 7.

If these are insufficient, pursue the other methods laid down by Howard. See Philosophical Magazine, vol. xxxv. 236.

ANTIMONII OXYDUM VITRIFICATUM CUM CERA. *A.*

Vitrified Oxyd of Antimony with Wax. Cerated Glass of Antimony.

Take of
- Yellow wax, ... one part;
- Vitrified oxyd of antimony, . . . eight parts.

Melt the wax in an iron vessel, and throw into it the powdered oxyd; roast the mixture over a gentle fire for a quarter of an hour, continually stirring it with a spatula: then pour it out, and, when cold, grind it into powder.

The glass melts in the wax with a very gentle heat; after it has been about twenty minutes on the fire, it begins to change its colour, and in ten more comes near to that of Scottish snuff; which is a mark of its being sufficiently prepared; the mixture loses about one-ninth of its weight in the process.

This medicine was for some time much esteemed in dysenteries. The dose is from two or three grains to twenty, according to the age and strength of the patient. In its operation, it makes some persons sick, and vomit; it purges almost every one; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly. It has been recommended of late in cases of cynanche trachealis, by Dr. Stearns, of the state of New-York.*

PULVIS ANTIMONIALIS. *A. L. D.*

Antimonial Powder. James's Powder.

OXYDUM ANTIMONII CUM PHOSPHATE CALCIS. *E.*

Oxyd of Antimony with Phosphat of Lime.

Take of
- Sulphuret of antimony, in coarse powder,
- Hartshorn, in shavings, of each, equal weights.

Mix and put them in a wide, red-hot iron pot, and stir the mixture constantly, until it be burnt into a matter of an ash grey colour, which is to be then removed from the fire, ground into powder, and put into a coated crucible; lute to this crucible another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours; lastly, grind the matter, when cold, into a very fine powder.

This is supposed to be nearly the same with the celebrated nostrum of Dr. James, the composition of which was ascertained by Dr. George Pearson, to whom we are also indebted for the above formula.

* See Medical Museum.

By burning sulphuret of antimony and shavings of hartshorn in a white heat, the sulphur is entirely expelled, and the antimony is oxydized, while the gelatin of the hartshorn is destroyed, and nothing is left but phosphat of lime, combined with a little lime. Therefore, the mass which results is a mixture of oxyd of antimony and phosphat of lime, which corresponds, at least as to the nature of the ingredients, with James's powder, which, by Dr. Pearson's analysis, was found to consist of 43 phosphat of lime, and 57 oxyd of antimony. M. Pulley also analysed some of James's powder, and found it composed of protoxyd of antimony 37, phosphat of lime 21, sulphat of potass 24, and potass combined with protoxyd of antimony 18.

Phosphat of lime is most conveniently obtained pure by dissolving calcined bone in muriatic acid, and precipitating it by ammonia. If the ammonia be quite free from carbonic acid, no muriat of lime is decomposed. Mr. Chenevix also found, that this precipitate is entirely soluble in every acid which can dissolve either phosphat of lime or oxyd of antimony separately, and that about 0.28 of James's powder, and, at an average, 0.44 of the pulvis antimonialis of the late London Pharmacopœia, resist the action of every acid.

In the new edition, twice the proportion of hartshorn shavings is used, which is said to obviate the inconvenience of the vitrification of part of the antimony when too high a temperature was applied, to render the process more manageable, and to furnish a whiter product; but it does not correspond with Dr. Pearson's analysis of James's powder, for which it was intended as a substitute, and alters materially the strength of an established preparation. Our National Pharmacopœia follows the London formula.

Medical use.—The oxyd of antimony with phosphat of lime, howsoever prepared, is one of the best antimonials we possess. It is given as a diaphoretic in febrile diseases, in doses of from three to eight grains, repeated every third or fourth hour. In larger quantities, it operates as a purgative or emetic. From its being insoluble in water, it must be given either in the form of a powder, or made into a pill or bolus.

ANTIMONII SULPHURETUM PRÆCIPITATUM. *A. L. E.*

Precipitated Sulphuret of Antimony.

Sulphur Antimoniatum Fuscum. *D. Brown Antimoniated Sulphur.*

Sulphureted Hydro-sulphat of Antimony.

Take of
- Solution of potass, ... four pounds;
- Water, ... three pints;
- Prepared sulphuret of antimony, . . two pounds.

Boil them in a covered iron pot, over a slow fire, for three hours, frequently stirring the mixture with an iron spatula, and adding water as it may be required. Strain the hot liquor through a double linen cloth, and add to it, when strained, as much diluted sul-

phuric acid as may be necessary to precipitate the sulphuret, which must be well washed with warm water.

Within the compass of a few years the Pharmacopœias had three preparations of antimony, which under different names, differed very little, in chemical or in medicinal properties. These were the celebrated *Kermes Mineral*, the *Sulphur Auratum Antimonii*, and the *Sulphur Antimonii Præcipitatum*.

If sulphuret of antimony and potash are united together, boiled in sufficient water, and filtered *whilst hot*, a portion of the oxyd of antimony combined with sulphur, which at the temperature of boiling water could be held in solution, falls down as the solution cools in a brown coloured precipitate. This *first* formed powder was the *Kermes;* after this was removed, a quantity of oxyd and of sulphur might still be produced, by adding to the solution almost any acid. This acid seizing on the potash, by which the antimonial oxyd and sulphur were maintained in solution, formed a salt which remained dissolved, whilst a bright orange coloured powder precipitated. This was the *Sulphur Auratum Antimonii.* If, instead of allowing the Kermes to precipitate of itself, and then by the addition of the acid producing the latter, the acid was added *at once to the hot filtered liquor,* it is obvious that a precipitate would ensue, which would consist of an intermixture of both the preceding, constituting the preparation above adopted by our Pharmacopœia, which is not exactly analogous to the golden sulphur of antimony.

Hydro-sulphuret of antimony is prepared either in the dry way (Dublin), or in the humid, as by the Edinburgh and London Colleges. When sulphuret of antimony is boiled in a solution of potash, water is decomposed, the hydrogen combines with the sulphur and the antimony is oxydized; and as long as the solution boils, it contains a mixture of hydro-sulphuret of potash and hydro-sulphuret of antimony. But, on cooling, a great part of the latter precipitates in the form of a red powder (Kermes mineral).

In the dry way, when sulphuret of antimony and carbonat of potass are melted together, the carbonic acid is expelled with effervescence, and a sulphuret of antimony and potass is formed. On boiling this in water, water is decomposed, the antimony is oxydized, and the hydrogen combines with the sulphur. The sulphureted hydrogen thus formed, combines partly with the potass, and with the oxyd of antimony.

Such is the present theory for the formation of kermes mineral. With regard to the practice; Lemery melted sixteen parts of sulphuret of antimony, and one of sulphur, with eight parts of carbonat of potass. The last edition of the Prussian Pharmacopœia directs two parts of sulphuret of antimony, and one of exsiccated carbonat of soda, to be melted, and afterwards boiled fifteen minutes in six or eight parts of water, which on cooling deposits a considerable quantity of kermes. The fluid from which the kermes has been deposited may be again boiled in the residuum of the first decoction, and it will dissolve a fresh portion of kermes; and this process may be re-

peated as long as there remains any to dissolve. After this, the residuum, when melted, consists almost solely of antimony. It therefore appears, that the alkali renders almost all the sulphur soluble, and only disposes the oxydizement of as much antimony as is capable of combining with the sulphureted hydrogen. There appears to be no reason why the whole of the antimony should not be converted into kermes by employing a proper addition of sulphur and alkali.

Kermes is also made in the humid way. Fourcroy boils, in twenty parts of water, six parts of pure potass of commerce, and into the boiling solution throws about the twentieth part of the weight of the alkali, or 0.3 of a part of powdered sulphuret of antimony, and continues the boiling for seven or eight minutes, then filters, and allows the kermes to precipitate by cooling. Hermbstadt uses very different proportions; for he boils twelve parts of sulphuret of antimony, and three of salt of tartar, in ninety-six parts of water, down to sixty-four, and then filters, &c. Gren employs four parts of sulphuret of antimony, sixteen of carbonat of potass, and sixty-four of water, and boils for several hours. Göttling boils eight parts of sulphuret of antimony, and two of sulphur, in a sufficient quantity of solution of potass down to one half.

The precipitated sulphuret of antimony, like the kermes, may be prepared either in the dry or in the moist way. The latter mode seems to be the most universally employed on the Continent. Göttling boils two parts of sulphuret of antimony, and three of sulphur, in a sufficient quantity of a recent solution of potass, filters the solution and precipitates with sulphuric acid, diluted with twelve times its weight of water. The Prussian College use equal parts of sulphuret of antimony and of sulphur. Wiegleb treats in the same manner two parts of sulphuret of antimony with one of sulphur. But to his proportions it has been objected, that the product resembles kermes more than sulphur auratum. If this objection be just, it must apply in a still stronger degree to the formula of the British Colleges, in which no sulphur is added.

In the dry way, two parts of sulphuret of antimony and three of sulphur may be melted with five or six of pure carbonat of potass in a covered crucible, as quickly as possible, poured into an iron mortar, reduced to powder, and dissolved by boiling the powder in water. The solution is to be filtered warm, diluted with a sufficient quantity of water, and precipitated with diluted sulphuric acid. By some, the solution is allowed to remain at rest for twenty-four hours before it be filtered, and some precipitate with nitrous acid.

The processes for making the golden sulphuret of antimony, depend on the property which the hydrogureted sulphuret of potass possesses, of dissolving, and retaining dissolved, even at ordinary temperatures, a portion of orange oxyd of antimony; and as the attraction by which potass exists in this compound is weaker than its affinity for acids, on the addition of any acid, the potass unites with the acid; a portion of sulphureted hydrogen gas escapes; and the oxyd of antimony, combined with the rest of the sulphur and hydrogen, are precipitated in the form of a light orange powder. When

the acid is added gradually, the proportion of oxyd of antimony always decreases, while that of the sulphur increases in each successive portion of precipitate. Hence in the old manner of preparing this substance from the scoriæ formed in reducing antimony from its sulphuret, and which contained but little sulphur, the two first portions of precipitate, being dark coloured, were rejected, and only the product of the third precipitation retained for use. The want of economy in this process is sufficiently obvious, as well as the very great improvement in modern times, of adding a sufficient quantity of sulphur, and precipitating the whole at once.

Medical use.—In its action on the body, the hydro-sulphuret of antimony is an active substance, and, according to its dose, acts as a diaphoretic, cathartic, or emetic. Its use is, however, in Great Britain and America, in a great degree superseded by more certain preparations. To adults the dose is a grain to two or more.

Adulterations.—It is said to be often sophisticated with chalk, &c. It ought not to effervesce with acids. It should be entirely vaporizable by heat, and it ought to be of a bright orange colour. A spurious article has been sold in England, it appears, consisting of sulphur and sulphuret of antimony coloured with Venetian red!

ANTIMONIUM TARTARIZATUM. *A. L.*

Tartarized Antimony.

TARTARUM ANTIMONIATUM *sive* EMETICUM. *D.*

TARTRAS ANTIMONII. *E.* *Tartrat of Antimony.*

Antimoniated or Emetic Tartar. *Tartras Antimonii et Potassæ.*

Take of
Antimony, (the metal) in powder, . . . one part;
Sulphuric acid, ... two parts.

Boil them to dryness in an open iron vessel, frequently stirring the mixture with an iron spatula. Wash out all the uncombined acid with water, and dry the residuum; to which add an equal weight of supertartrat of potass, dissolved in water; then boil in an iron vessel, filter, and set by to crystallize. The evaporation, filtration, and crystallization, may be repeated with the fluid which remains; but if the crystals are not perfectly clear, they must be dissolved in water and recrystallized.

The tartaric acid is capable of combining, in many examples, with two bases at the same time, forming with them triple crystallizable salts. In the present instance, it is combined with oxyd of antimony and potass; and as the potass is essential to its constitution, and the real tartrat of antimony is a different salt, its name, on chemical principles, should certainly have been tartrat of antimony and potass.

In the preparation of this salt, the different combinations of pro-

toxyd of antimony have been employed. Any of them will afford a very pure salt. The crocus, precipitated oxyd, submuriat and glass, are all occasionally employed. The Edinburgh College uses the crocus. To this the principal objection is, that it is never found in the shops in a state fit for this purpose. Even when properly prepared, it is with difficulty acted upon by the supertartrat of potass, unless it be levigated and elutriated. Mr. Phillips found, that 100 parts of cream of tartar dissolved only six parts out of 100 of very finely powdered crocus, 16 when levigated, but 75 when it was elutriated; and in the last case, the liquor assumed a deep green colour, which, though proceeding from the presence of iron, is a test that a sufficient proportion of the metallic oxyd is dissolved, as it does not occur until the tartar has taken up three-fourths of its weight of the crocus. But, besides the expense of levigating and elutriating the crocus, it is liable to be mixed with carbonat of lime, derived probably from the stones employed in the levigation; and the crystals of tartarized antimony procured in this way, are consequently contaminated even with a larger portion of tartrat of lime than is furnished by the tartar. The glass is more easily soluble than the crocus, as, when finely powered, 78 parts were dissolved, and gave the solution a dark green colour. But this oxyd is very expensive, and glass of lead is sometimes fraudulently substituted for it. When the glass or crocus is used, Mr. Phillips recommends, that after being powdered or levigated, they should be boiled in dilute sulphuric acid to remove any carbonat of lime, and that a small quantity of sulphuric acid should be added to decompose the tartrat of lime. To the oxyd of antimony, as prescribed by the London College, 1809, Mr. Phillips objected its great expense, its quantity being too small in proportion to the tartar; and that the crystals of tartar emetic formed with it, as well as with the crocus or glass, are contaminated with the tartrat of lime usually contained in the tartar. To the use of the submuriat, as directed by the Dublin College, this last objection does not apply, because the muriatic acid retains the tartrat of lime in solution when the tartrat of antimony crystallizes. Having criticized the processes of all the Colleges, Mr. Phillips proposed to substitute one of his own. The qualities requisite in an eligible method of preparing tartar-emetic, he says, are, the certainty of obtaining protoxyd of antimony unmixed with peroxyd or sulphureted oxyd, yet not absolutely pure, but mixed with a substance capable of preventing the crystallization of the tartrat of lime; moderate expense, and the possibility of using iron vessels, both in preparing the oxyd of antimony and the tartarized antimony. These requisites, Mr. Phillips thinks, he has found in employing the sulphat of antimony prepared by boiling powdered metallic antimony in twice its weight of sulphuric acid to dryness in an iron vessel over a common fire, and stirring it with an iron spatula. The greyish coloured product was thrown into water, and washed, till the uncombined sulphuric acid was removed. One hundred parts of the subsulphat thus procured were boiled in a solution of an equal weight of tartar; about 76 parts of the subsulphat were readily dissolved, and the so-

lution, when filtered, afforded at the first crystallization rather more than 90 parts of crystals of tartarized antimony, perfectly white and unmixed with any extraneous salt. The solution, by further evaporation, furnished an additional quantity of crystals of emetic tartar, slightly incrusted with sulphat of lime, from which, however, they were completely purified by solution, and repeating the crystallization. A considerable quantity of sulphat of lime was also deposited and separated during the evaporation. This process Mr. Phillips asserts to be neither tedious, difficult, uncertain nor unsafe. The process adopted in the present edition of the London Pharmacopœia is of the same nature, depending upon the formation of a sulphat of antimony, although in a more complicated way. Dr. Powell tells us that the new formula, which "has, after numerous trials, been adopted, is due to Mr. Hume of Long-Acre, to whose practical skill it is right to acknowledge great obligation. It is necessary that the whole of the supertartrat of potass should be combined with the oxyd, and therefore that there should be a full sufficiency of the latter, otherwise the first crystals, as it cools, will be of the supertartrat only; whilst, on the other hand, if a superabundance of oxyd of antimony be used, it will remain upon the filter, and not influence the crystals: the former inconvenience, therefore, is especially to be avoided, and for that purpose, more oxyd than may be strictly necessary is directed. The evaporation must not be carried too far, as there appears to be some tartrat of potass in the solution, whose crystals will, in that case, be mixed with the triple salt. The crystals ought always to be formed, for it is only when they are that the proportions of the salt can be considered as precise." But whatever form of protoxyd of antimony may be preferred, the quantity of water employed must be sufficient to dissolve the tartar emetic formed. The time during which ebullition is to be continued, is stated differently by different pharmaceutists. No harm can arise from continuing it longer than is absolutely necessary; but it is certainly a waste of time and fuel to protract it for hours.

Another circumstance which renders tartar emetic variable in its effects, is, the mode of crystallization. Some evaporate it to dryness; others to a pellicle, and set it aside to crystallize; and others again crystallize by slow evaporation. On account of the silica which is combined with the oxyd of antimony, and which, being held in solution by the potass, impedes the crystallization, and varies the nature of the product, Vauquelin recommends that the solution be first evaporated to dryness, and that the saline mass obtained should be redissolved in boiling water, and then crystallized; for towards the end of the first evaporation, the silica separates, and becomes totally insoluble. In this way, he says, we obtain both a purer salt, and in larger quantity. If we employ an excess of supertartrat of potass, part of it will remain undecomposed, and will crystallize before, or along with the tartar emetic. This source of impurity is easily avoided, by using an excess of the antimonial oxyd, which remaining undissolved, occasions no error, and prevents the necessity of throwing

away the crystals which form on the filtering paper, if the solution be saturated.

The primitive form of the crystals of tartrat of antimony and potass seems to be the regular tetrahedron, but it assumes a variety of secondary forms. It has a styptic metallic taste. It is soluble in three times its weight of water at 212°, and in fifteen at 60°. As this statement of its solubility is very different from that of most writers, from Bergmann to Fourcroy, who say that it requires 80 parts of water at 60°, and somewhat less than 40 of boiling water, it is necessary to mention, that it was ascertained by careful experiment, with very fine crystals of tartar emetic, more than half an inch in length, and perfectly free from the admixture of any foreign salt. The crystals, by exposure to the air, become white and opaque, but do not readily fall to powder. The property of deliquescing, ascribed to them by Göttling, must have arisen from the presence of other salts, as he does not prepare his tartar emetic by crystallization, but by evaporating the solution to dryness. The solution of tartar emetic slightly reddens tincture of turnsole. It is decomposed by acids, alkalies, alkaline carbonats, sulphureted hydrogen and its compounds, vegetable juices, decoctions and infusions, and many of the metals.

In its chemical composition there is still much obscurity; whether it be a triple salt, consisting of tartaric acid, oxyd of antimony and potash, or a mixture of tartrat of antimony and tartrat of potash, seems not yet fully agreed on. Others have even supposed that in this combination, the *supertartrat of potash* acts the part of a *simple acid*, which is by no means improbable.*

Tartar emetic should always be purchased in crystals; a solution of it in distilled water, ought to furnish a copious gold coloured precipitate with dilute sulphuret of potash or ammonia; a precipitate soluble in nitric acid, with acetat of lead; and with lime water, a white and extremely thick precipitate, dissolving with facility in pure nitric acid. If the crystals deliquesce, the presence of other salts may be inferred; and they ought to readily and totally *dissolve* in water, forming a *clear solution* both previous to, and after adding the wine, in making the antimonial wine.

Incompatibles. Mineral acids, alkalies and their carbonats, many of the metals, soaps, hydrosulphurets, and many infusions and decoctions of bitter and astringent vegetables: thus, one fluid ounce of decoction of yellow bark, completely decomposes one scruple of tartar emetic and renders it inert; hence it is useful when an over dose has been taken. Rhubarb is equally incompatible, but gentian and wormwood, it is said, do not decompose it. Alkaline sulphats if *neutral*, are not incompatible; but if the acid is in excess, a white, insoluble sulphat of antimony is precipitated.

Medical use.—In doses of from one to three grains it operates as an emetic, and sometimes as a cathartic. In smaller doses, it excites nausea, and proves a powerful diaphoretic and expectorant. As an

* On this account, we apprehend, the well known name of Tartar Emetic should supersede every other denomination.

emetic, it is chiefly given in the beginning of fevers and febrile diseases, in chincough, and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretic, it is given in small doses, or from an eighth to a quarter of a grain; and as an expectorant, in doses still smaller.

The only proper form for exhibiting it is in solution; and as the intensity of its action on the body is liable to variation, from differences in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting; and at longer intervals, if we wish it to act only on the skin or lungs.

This salt forms a most beneficial application as a rubefacient, in deep seated inflammations, especially of the chest; it occasions a *pustular* eruption on the skin, of a very singular aspect, the cicatrices of which are permanent for a long time. It may be used in the proportion of one or two drachms, incorporated with one ounce of lard, or it may be dusted over a piece of leather spread with adhesive plaster, taking care to leave a margin untouched that it may adhere more firmly.

With respect to the formula adopted by our National Pharmacopœia, we observe it is that proposed by Mr. Phillips; which, although now some years before the public, has not met the approbation of any of the Colleges. Dr. Hope asserts, that having, in conjunction with Dr. Duncan, jun. tried it, as well as those of the Dublin and London Colleges, he sees no reason for preferring any of them to that of Edinburgh.

Whether the plan thus proposed by Mr. Phillips, and adopted by the United States' Pharmacopœia, is superior to the others, I am not prepared to say. I have tried several of them, and I must confess my predilection is favourable to that of Dublin. The chief objection I have to that of Mr. Phillips, is, that it at present stands solely on his own authority; it has not that I know of, been tried on the large scale, and we well know that this is at least a proper test of the real goodness of many articles. It is not the apparent simplicity of the process alone, which should induce its recommendation without a *full trial.* Has this been done? Were any comparative experiments of the value of the different formulæ instituted, previously to adopting that presented?

The Dublin formula is here subjoined, and from a frequent repetition of the process, I am disposed to consider it as much superior to any other which I have tried.

Take of
Nitromuriatic oxyd of antimony, ... two ounces;
Crystals of tartar, in very fine powder, . two ounces and a half.
Distilled water, ... eighteen ounces by measure.

Boil the water in a glass vessel, then gradually throw into it the oxyd and tartar, previously mixed, and boil for half an hour; then filter the liquor through paper, and crystallize by slow cooling.

VINUM ANTIMONII TARTARIZATI. *A.*

Wine of Tartarized Antimony.

VINUM TARTRATIS ANTIMONII. *E.*

LIQUOR ANTIMONII TARTARIZATI. *L.*

Antimonial Wine.

Take of
Tartarized antimony, ... two scruples;
Boiling distilled water, . . . four fluid ounces;
Wine, ... six fluid ounces.

Dissolve the tartarized antimony in the boiling distilled water; then add the wine.

This is a very important article of *domestic* medicine, and of consequence, therefore, ought to be of uniform strength. The English Colleges differed in this particular, that of Edinburgh containing only two grains to the ounce, whilst that of London was double the strength. They have latterly made it of the same standard, viz: two grains to the ounce. Our Pharmacopœia has judiciously continued the stronger preparation of four grains to the ounce.

In its employment and effects, it is analogous to a watery solution of tartar emetic of equal strength.

APOCYNUM ANDROSÆMIFOLIUM. *A.*

Dog's bane. The Root.

This is a perennial lactescent plant, found from Canada to Carolina, of the class *pentandria,* order *digynia,* in the natural order *contortæ* of Linnæus, and *apocineæ* of Jussieu.

From the facts connected with it, it is concluded that it contains a bitter extractive principle, a colouring principle, soluble in water and not in alcohol, caoutchouc, and a volatile oil.

Thirty grains of the root evacuate the stomach as effectually as two-thirds of the amount of ipecacuanha; by which name it is known in various parts of the eastern states. Its power is diminished by keeping, and is destroyed by age.

It is placed in the secondary list of the Pharmacopœia; and there it is probable it will remain, unless further trials should discover more ample virtues in it.

AQUA.—*WATER.*

It is rather surprising that water, an article the most abundantly employed in medicine, should never have been regularly admitted into the lists of the Materia Medica. It is now introduced into the National Pharmacopœia; and in point of real efficacy, few will deny that it is equal to almost any other individual substance in the cure of disease. What should we anticipate from the use of our sudorifics, diuretics, &c. without the co-operation of this important agent; how greatly would a want of it tend to baffle the most anxious exertions of the practitioner! It is its universal distribution that has caused us to overlook the benefits we derive from its employment on every occasion.

Water chemically considered consists of hydrogen combined with oxygen in the proportion of 14.42, to 85.58, by weight, or two of hydrogen to one of oxygen, by volume. Water is transparent, colourless, inodorous, and insipid. As water is assumed as the standard, or unity, in all tables of specific gravity, it is necessary to know that a cubic inch of it weighs, at 30 inches of the barometer, and 60° thermometer, 252.422 grains. At 32° it exists in a solid form, and is crystallized. At 212° it expands to 2000 times its bulk, and is converted into a very elastic vapour. It absorbs small quantities of the simple gases, especially oxygen. It dissolves several of the salifiable bases, and in some degree all saline bodies, and is essential to their crystallization. It is composed and decomposed in many instances, and its chemical agency is almost universal. It is the only binary combination of hydrogen with oxygen, at present known with certainty.

Water, from its extensive powers as a solvent, never occurs in a state of absolute purity; the nature and degree of its contamination must necessarily vary according to circumstances. It generally holds earthy matter in a state of mechanical suspension, or saline and other bodies in chemical solution. Celsus has laid down the following arrangement, &c. as it respects water, and it can scarcely be amended in the present day. "Aqua levissima pluvialis est; deinde fontana, tum ex flumine, tum ex puteo; posthæc ex nive, aut glacie; gravior his ex lacu, gravissima ex palude."*

1. Aqua Pluvialis. *Rain Water.*

This, when collected in the open fields, is the purest natural water, and of the least specific gravity. The only bodies which it holds in solution are carbonic acid, and minute traces of carbonat and muriat of lime.

2. Aqua Fontana. *A. Spring Water.*

In addition to the substances detected in rain water, spring water generally contains a small proportion of muriat of soda, and fre-

* Celsus, B. 2. c. 18.

quently other salts; the larger the springs, in general, the purer; more especially those which occur in primitive countries, and in silicious rocks or beds of gravel. The water of some springs dissolves soap, that of others decomposes and curdles it; the former are called *soft*, the latter *hard* water, and is a practical fact of some importance. Soft water is a more powerful solvent of all vegetable matters, and is preferable both for domestic and medicinal employment. Even animals instinctively prefer it.

3. Aqua Fluvialis. *River Water.*

This is derived from the conflux of numerous springs and rain water. It is generally pretty pure, although its transparency is often impaired from the mechanical suspension of earthy matter.

4. Aqua Putealis. *Well Water.*

This is essentially the same as spring water, but more liable to impurity from its confinement, and slow infiltration through the walls, the soluble parts of which are carried along with it. Old wells are therefore generally superior to recent ones, and the more the water is drawn from it, the softer does it become.

5. Aqua Nivata. *Snow Water.*

This water, from time immemorial, has been deemed unwholesome; but it would seem an unfounded supposition. There is nothing in its composition in which it differs from rain water, and our fountains and rivers owe much of their water to the melting of snow during the warmer seasons.

6. Aqua ex Lacu. *Lake Water.*

The accumulation of water in one place, contaminated by the putrefying processes of animal and vegetable bodies, must necessarily be less pure than those waters previously noticed. This will depend considerably also on the magnitude of the collection, and the degree of its stagnation.

7. Aqua Paludosa. *Marsh Water.*

As this is the most stagnant, so it is, generally speaking, the most impure of all water, and is more loaded with decomposing vegetable and animal matters.

To what extent the impurities of water are capable of influencing their salubrity, has been a subject of inquiry from the remotest period. Too much importance has been attached to many of these natural contaminations. Unless in large amount, it is the height of affectation to suppose the quality of water can be rendered noxious

by the presence of *minute portions* of such earthy salts as usually occur in solution. No persons are healthier than the inhabitants of limestone districts; habituated to the use of water strongly impregnated with that earth, they feel no ill effect from it, whilst a stranger is generally disordered by its use. All metallic contaminations, with the exception perhaps of iron, are highly injurious, and should be carefully avoided.

For the purification and preservation of water, numerous modes have been adopted. Mechanical impurities are removed by filtration in various ways; muddy water may also be cleared by adding a few grains of alum to each pint; and when water has contracted a putrid smell, it may be rendered sweet by passing it through charcoal, or by agitation with a small portion of magnesia, or with black oxyd of manganese, in the proportion of $1\frac{1}{2}$ parts to 250 of water.

Water, when kept for a long time in casks, especially on long voyages, is partially decomposed; carbureted hydrogen is evolved, which imparts to it its characteristic taste and smell. This is partly obviated by charring the inside of the casks, or by substituting iron tanks for wooden vessels.

In pharmacy, common water, if employed, should not be *hard;* filtered rain water will answer for most purposes. It is, however, thought necessary on many occasions, with an undue degree of refinement, to direct the use of

AQUA DISTILLATA. *A. E. L. D.* *Distilled Water.*

Let water be distilled in very clean vessels until about two thirds have come over, which is to be kept in a glass bottle.

This process is more especially required for chemical processes, in which the heterogeneous matters removed by distillation, might produce changes not desirable; but for infusions or decoctions, it cannot be deemed essential, if pure rain or river water is at hand. It is best to avoid all *unnecessary* rules, lest they be infringed, without the possibility of detection. Whenever in extemporaneous prescriptions, the following substances are employed, distilled water may correctly be ordered, for changes are often induced by the chemical action of the saline matters contained; viz. nitrat of silver, cuprum ammoniatum, corrosive sublimate, aqua ammoniæ, sugar of lead, muriat of barytes, &c.

In order to test the purity of water, its transparency ought to be undisturbed by the nitrat of silver, muriat of barytes, or oxalat of ammonia.

Of Mineral Waters.

Although all waters that flow from the earth, are, inasmuch as they contain mineral bodies in solution, strictly speaking, *mineral* waters; yet custom has restricted the term to such only, as are distinguished from those already mentioned, by a peculiarity in colour,

taste, smell, or any obvious properties, or by the medicinal effects they are known to be capable of producing on the system.

Whatever, however, may be strictly due to mineral waters as medicinal agents, certain it is, that far too much has been ascribed to them, and too little to the concurring circumstances of their exhibition. There is scarcely a water found in nature which cannot be imitated by art, and even with much augmented strength; and yet it is sufficiently obvious, that drunk at home, they are not equally beneficial, as when taken at their source. If this were not true, where is the necessity of ordering patients to take a long and perhaps inconvenient and expensive tour, when our mineral fountains are at hand for their relief. A variety of causes co-operate to render the journey expedient and useful, of which the mere drinking of the waters constitutes the least part. The journey itself, of perhaps some hundred miles, is an active source of health; a cessation from the continued routine of domestic and official duties; a complete change of the habits of life; of scene; of company: perhaps the substitution of a wholesome beverage, water, in place of excess in wine, or ardent spirits. These and other causes which will occur upon reflection, will be found the most efficient sources of renewed health. In increasing the discharges from the various emunctories, the copious draughts of the mineral waters taken, undoubtedly are useful; but they are alone inadequate to the end proposed.

Be this, however, as it may; it is usual to divide mineral waters into *acidulous, chalybeate, sulphurous*, and *saline*.

Some springs are useful from the increased temperature which accompanies them, rather than from any active ingredient in their composition, and are called *warm* springs. Examples of which are found in every country.

1. Acidulæ. *Acidulous,*

Owe their properties chiefly to an excess of carbonic acid. They have an acid pungent taste, and sparkle like Champagne on being poured out. They generally contain some muriat of soda, and some earthy carbonats. They are considered tonic and diuretic.*

They are transiently exhilirating in large doses, and stimulant. They are considered serviceable in bilious complaints, atony of the stomach, nausea, vomiting, and fevers of a typhoid type.

The most celebrated waters of this description, are those of *Pyrmont, Seltzer, Spa*, on the continent of Europe; *Cheltenham* and *Scarborough*, in England; and *Saratoga* and *Ballston*, in the United States.

* Which last property we believe will be admitted to belong even to *common* water, when drank as largely. Dr. Meade, in his account of the Saratoga Springs, &c. mentions, seventy-five glass-fulls of the water to have been drank in a day!! If they had not fortunately proved diuretic, the person must have burst; for at the most moderate calculation of *half pint* glasses, it amounts to four gallons and a half, or the volume of a good sized demi-john.

2. Chalybeatæ. *Chalybeates.*

These contain *iron* in the form of sulphat, carbonat, or muriat. They have a styptic inky taste, strike a black colour with galls, oak bark, or other vegetable astringent, some of them, in which the iron is held dissolved by *carbonic* acid, are acidulous; and deposite the iron in form of an ochre, by boiling; as is the case with the *Pyrmont* and *Spa* water. Others, in which sulphuric acid is the solvent, retain their power of striking a black colour *after* being boiled and filtered. There is scarcely any country which does not largely abound with chalybeate springs. Tunbridge, Brighton, Bath, Scarborough, &c. in England; Carlsbad, Vichy, &c. on the Continent. With us, they are too numerous to mention.

These waters are used as tonics in cases of debility, cachexia, chlorosis, fluor albus, amenorrhœa, and nervous diseases. They stimulate and increase the circulation; and generally act as gentle laxatives, from containing neutral salts.

3. Sulphureæ. *Sulphurous.*

These derive their character from sulphureted hydrogen, (hydrosulphuric acid,) either uncombined or united with lime, an alkali, iron, &c., as at *Enghien*, *Aix-la-Chapelle*, *Harrowgate*, *Moffat*, and others in Europe. The sulphurous waters in our own country are also abundant. They are known by their stinking smell, resembling a rotten egg, or washing of a gun barrel; they blacken a piece of *bright* silver when placed in them.

These are chiefly used in cutaneous and glandular diseases; they are stimulant and heating, and operate on the skin and bowels.

4. Salinæ. *Saline.*

These, for the most part, are purgative, from containing different saline ingredients, such as common salt, which waters are known by their saltish taste; the formation of small crystals in cubes, by evaporation; precipitating the nitric solutions of lead, silver, or mercury in white clouds.

Some of the proper purging springs, such as Epsom, &c. have a bitter taste, precipitate the nitric solutions of silver, lead, and mercury, are not affected by acids, but afford precipitates with carbonat of potash.

Others are of an *alkaline* nature, and turn blue vegetable colours to a green; they effervesce with acids, and yield a precipitate with alum water. Such are Carlsbad, Barege, and some others. They are used in diseases of the urinary organs, and in morbid acidity of the stomach, &c.

Some are *calcareous*, as Matlock, Buxton, and all *hard* waters, called also petrifying waters; they contain carbonat of lime in solution, which they deposite, by standing or boiling. In general they

may be considered unwholesome. The presence of lime may be discovered by means of the oxalat of ammonia.

Purging waters derive their effects from the neutral salts they contain, especially the muriats of soda, lime, and magnesia, and sulphats of soda and magnesia. They are frequently employed for a long time together, to keep the bowels open, by exciting the natural action, rather than to produce full purging; and they thus tend to increase the appetite, health, and strength.

We may class along with the foregoing,

Aqua Marina. *Sea Water.*

This has heretofore been stated to contain large quantities of common salt and Epsom salt. The discordant analysis of different chemists were wondered at, and showed the imperfection of that branch of inquiry, until the able researches of the late Dr. Murray evinced, that in the examination of a mineral water, or any compound saline solution, the *substances obtained from it are not necessarily the original ingredients,* but are frequently the products of new combinations established by the operation of analysis; and that consequently the nature of the results obtained, may vary according to the mode of analysis, or even the degree of dilution in which the saline substances exist. The elements of the salts contained in a pint of sea water, are

Lime,	2.9
Soda,	96.3
Muriatic acid,	97.7
Magnesia,	14.8
Sulphuric acid,	14.4
Total	226.1 grains.

Now supposing these elements to be combined in the mode which Dr. Murray's views appear to establish,* the saline contents of a pint of sea water may be thus expressed.

Muriat of soda,	159.3
Muriat of magnesia,	35.5
Muriat of lime,	5.7
Sulphat of soda,	25.6
Total	226.1 grains.

A small portion of potash has also been discovered in it.

Besides such saline contents, it is contaminated with animal and vegetable bodies, which render it, by keeping, highly offensive. Sea water is well known to be purgative, and forms at sea, an excellent clyster. It is taken to the amount of about a pint in the morning, as a cathartic, at two doses, with an interval of half an hour. This quan-

* See Transactions of Royal Society of Edinburgh, 1816.

tity contains half an ounce of purgative salt, of which nearly three-fourths are muriat of soda. A precaution should be attended to in procuring sea water, that it *be not hastily* drank, before the particles of sand, &c. are allowed to subside; from neglect of which, it is asserted, serious consequences have been witnessed. Its chief use is, however, that of a bath.

It may be observed, that in general, *soluble* salts are capable of exerting a much more powerful effect upon the animal economy, than those which are insoluble; on which account, the earthy muriats, especially that of lime, are amongst the most active ingredients of the mineral waters. Although chemical analysis has frequently failed, from its own imperfection, in ascertaining their presence, it seems probable that *muriat of lime*, and *sulphat of soda*, exist in all those springs that furnish, by the usual methods of examination, *sulphat of lime*, and *muriat of soda;* for the same reasons it is equally probable, that iron, which from the analysis of certain waters, has been supposed to exist as a *carbonat*, is, in its native solution, a true *muriat*.

For the investigation of the true composition of mineral water, Dr. Murray has furnished a simple and elegant formula: viz.

Determine by precipitants, the weight of the acids and bases; suppose them united in such a manner, that they shall form the most soluble salts; and these salts will constitute the true saline constituents of the water under examination.

To this we may add, that the quantity of salts contained in any mineral water, may be estimated with considerable accuracy, by finding the *difference of weight* between a bottle filled to a certain mark with distilled water, and when filled with the mineral water. To this difference add one-fifth, and again another fifth: the weight will then denote that of the salts contained in the bottle of water. A square case bottle is well adapted for this purpose.

Suppose the difference to be 79 grains; *one-fifth* is $15\frac{4}{5}$ grains, another fifth, the same, $= 31\frac{3}{5}$, to be added to 79 grains, $= 110\frac{3}{5}$ grains, the amount of saline matter.

Of the Medicinal effects of Water, and its general uses in Medicine, &c.

Water is an essential constituent in the organization of all living bodies: and as it is continually expended during the process of life, that waste must be also continually supplied, and this supply is of such importance that it is not left to reason or to chance, but forms the object of an imperious appetite. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. Water at about 60° gives no sensation of heat or cold; between 60° and 45° it gives a sensation of cold followed by a glow and increase of appetite and vigour; below 45 the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60 it excites nausea and vomiting, probably by

partially relaxing the fibres of the stomach, for when mixed with stimulating substances it has not these effects. In the stomach and the intestines it acts also by its bulk, producing the effects arising from the distention of these organs, and as the intestinal gases consist of hydrogen gas, either pure, or carbonated, or sulphureted, or phosphureted, it is probably in part, decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals, dilutes the chyle and the blood, increases their fluidity, lessens their acrimony, and produces *plethora ad molem.* Its effects in producing plethora and fluidity are, however, very transitory, as it at the same time increases the secretion by the skin and kidneys. Indeed the effects of sudorifics and diuretics depend in a great measure on the quantity of water taken along with them.

The external use of water depends almost entirely on its temperature, which may be

1. Greater than that of the body, or above 97° Fah. The hot bath.
2. Below the temperature of the body.
   a. From 97 to 85, the warm bath.
   b. From 85 to 65, the tepid bath.
   c. From 65 to 32, the cold bath.

The hot bath is decidedly stimulant in its action. It renders the pulse frequent, the veins turgid, the skin red, the face flushed, the respiration quick, increases animal heat, and produces sweat. If the temperature be very high, the face becomes bathed in sweat, the arteries at the neck and temples beat with violence; anxiety, and a sense of suffocation are induced, and if persisted in, vertigo, throbbing in the head, and apoplexy, are the consequences. It is very rarely employed in medicine, except where there are hot springs, as at Baden in Switzerland. The Russians and some other nations use the hot bath as an article of luxury.

The effects of the affusion of hot water have not been ascertained, and it is probable that when the heat is not so great as to destroy the organization of the skin, the very transient application of the water would be more than counteracted by the subsequent evaporation.

With regard to the action arising from their temperature, all baths below 97° differ only in degree, as they all ultimately abstract caloric from the surface, but with a force inversely as their temperature.

The warm bath excites the sensation of warmth, partly because our sensations are merely relative, and partly because its temperature, though less than that of the internal parts of the body, is actually greater than that of the extremities which are the chief organs of touch. But water being a much better conductor of caloric than air, and especially than confined air, as much caloric is abstracted from the body by water, which is only a few degrees lower than the internal temperature of the body, as by air of a much lower temperature. The warm bath diminishes the frequency of the pulse,

especially when it has been previously greater than natural, and this effect is always in proportion to the time of immersion. It also renders the respiration slower, and lessens the temperature of the body, relaxes the muscular fibre, increases the bulk of the fluids by absorption, removes impurities from the surface, promotes the desquamation and renewal of the cuticle, and softens the nails and indurations of the skin.

The stimulant power of the warm bath is therefore very inconsiderable, and its employment in diseases will be chiefly indicated by preternatural heat of the surface and frequency of the pulse, rigidity of the muscular fibre, and morbid affections of the skin. It has accordingly been found serviceable in many cases of pyrexia, both febrile and exanthematous, in many spasmodic diseases, and in most of the impetigines. It is contra-indicated by difficulty of breathing, and internal organic affections, and should not be used when the stomach is full.

The affusion of warm water very generally produces a considerable diminution of heat, a diminished frequency of pulse and respiration, and a tendency to repose and sleep; but its effects are not very permanent, and its stimulus is weak. It is recommended in febrile diseases depending on the stimulus of preternatural heat, and in those attended with laborious respiration, and in the paroxysms of hectic fever.

As the tepid bath and affusion produce effects intermediate between those of warm and cold water, it is unnecessary to enumerate them.

The cold bath produces the sensation of cold, which gradually ceases, and is succeeded by numbness. It excites tremors in the skin, and shivering. The skin becomes pale, contracted, and acquires the appearance termed cutis anserina. The fluids are diminished in volume; the solids are contracted, the caliber of the vessels is lessened, and therefore numbness and paleness are induced, and the visible cutaneous veins become smaller. There is a sense of drowsiness and inactivity, the joints become rigid and inflexible, and the limbs are affected with pains and spasmodic contractions. The respiration is rendered quick and irregular; the pulse slow, firm, regular, and small; the internal heat is at first diminished, but gradually and irregularly returns nearly to its natural standard; the extremities, however, continue cold and numb, or swollen and livid; the perspiration is suppressed, and the discharge of urine is rendered more frequent and copious. If the cold be excessive on its application, long continued violent shiverings are induced, the pulse ceases at the wrist, the motion of the heart becomes feeble and languid, there is a sensation of coldness and faintness at the stomach, and a rapid diminution of animal heat; and at last delirium, torpor, and death, are the consequences. If the application of the cold bath be not carried to an excessive length, on emerging from the water, the whole body is pervaded by an agreeable sensation of warmth, and the patient feels refreshed and invigorated.

The primary action of the cold bath is stimulant, and the degree of this action is in proportion to the lowness of its temperature. Much has been said as to the stimulant and sedative effects of cold, but being altogether theoretical, we pass it by, with the observation, that the action of cold is complicated, and varies according to its intensity, duration, and the state of the system to which it is applied. It acts, at first, as a stimulant in exciting sensation, then as a tonic in condensing the living fibre, and lastly, however paradoxical it may appear, as a sedative, by preventing that distribution of blood in the minute and ultimate vessels, which is necessary for the existence of sensibility and irritability.

The cold bath may be therefore so managed as to procure any of these effects, by regulating the length of time for which it is applied. It may be employed in fevers, and febrile paroxysms, when the heat is steadily above the natural standard, and in many diseases arising from relaxation and debility. It is contra-indicated when the heat of the body is below 97°, when there is any notable perspiration from the surface, when there is general plethora, and when any internal organ is diseased. Irritable habits should be defended from the violence of its action, by covering the body with flannel.

Cold affusion, or the pouring of cold water over the body, is a very convenient way of applying the cold bath in many cases. In this way cold is very suddenly applied to the surface, its operation is instantaneous and momentary, but may be continued by repeated affusions for any length of time, and so as to produce its extreme effects. Where the effects of cold affusion may be thought too severe, spunging the body with cold water, or water and vinegar, may be substituted.*

The following directions for warm and cold bathing are so judicious, that I persuade myself their introduction will be acceptable to my readers. They are extracted from a newspaper.

COLD AND WARM BATHING.

The following directions for the use of the Warm and Cold Bath are extracted from an interesting treatise on the subject, by Dr. Coffin, of Boston.

There is considerable diversity of opinion respecting the best time for bathing, some preferring the morning, some the forenoon, and others the evening. The best time, however, for bathing, is the hour before dinner, and next to this is undoubtedly before breakfast; when, if there is any deficiency of warmth, the temperature of the body must be raised by any sufficient exercise.

It is always hurtful to bathe soon after taking food; it is indeed never advisable to bathe, except when the stomach is empty, or

* For a particular account of the medical use of the cold bath, &c. see the valuable work of Dr. Currie of Liverpool, on that subject.

nearly so. After leaving the water, the body should be briskly wiped with a coarse towel, or piece of crash, and immediately covered with clothes sufficient to excite, or preserve the temperature of health.

After bathing, it is well to take a moderate degree of exercise. But invalids should be careful not to prolong the ride or walk, especially if exposed to the rays of a hot sun, so far as to produce sweating or lassitude; as this would counteract all the refreshment and renovated strength which would otherwise attend the practice.

To bathe every second and third day is ordinarily sufficient for all the good purposes of bathing. Daily bathing is not unfrequently found to produce a degree of languor and wasting of the body; but if no other bad effects arise, these symptoms will soon disappear after discontinuing the bath.

The shock of the shower bath is more formidable and unpleasant to most people, than that of sea bathing; it has, however, several conveniences over the latter. This may be taken on rising from bed, without going from home, or costing any time worth regretting; and the quantity of water and its temperature can be easily adapted to the state of him who receives it. And as its impression is more transient than the effects of sea bathing, it may be used more frequently than the latter.

From what has been said, I would deduce the following rules, by which the practice of cold bathing should be regulated:

1. We are never to enter the cold bath when the temperature of the body is below the standard of health; if it is a few degrees above this, the bathing will be proportionably more grateful and invigorating.

2. We should never remain long in the water; not longer than to secure a vigorous re-action. The common mistake on this point is, not only to remain in the water till the glow of warmth arising from the shock is established, but till it is dissipated by continuing in the water too long, or by returning to it too often.

3. We are to bathe before breakfast; or better, before dinner.

4. We are to bathe when the stomach is empty, or nearly so; and

5. We are to bathe every second or third day only; or if our bathing depends on the tide, we may bathe several days in succession, and then omit it as many.

The warm bath could not have been safely recommended, or advantageously used, as a preventive or cure, before the invention of the thermometer, by which, when practicable, and not by the feelings of the patient or bather, ought its temperature to be regulated. Where a thermometer cannot be had, the rule should be this: bring the water to that temperature which feels neither hot nor cold to the arm, or some part of the body usually covered, and after entering the bath at this degree of warmth, its heat may be raised to the temperature just mentioned.

On commencing a course of warm bathing, the first thing to be at-

tended to is the heat of the water. Any bath may be denominated warm, whose heat is sufficient to produce and continue the sensation of warmth, while we are in it.

But there is no one degree of heat that will always produce this effect, because the animal heat of different persons is not always the same, nor is the temperature of the same person at all times alike, but varies with the different states and conditions in which he may be placed.

This fact is very important, though rarely noticed; it is important, because without attending to it, we cannot so modify the temperature of the bath as to suit it to particular cases.

Whether the warm bath is, in any given instances, to be grateful, or otherwise, hurtful or beneficial, must depend chiefly in its temperature and duration being properly adjusted to the state of him who bathes. The best temperature for persons in health, is that degree of heat which will produce the most pleasurable sensations.

This degree of heat corresponds most commonly to the 93d degree of Fahrenheit's thermometer.

We are, then, to bring the water to this temperature, before we enter the bath, and after being in the water two or three minutes, and attending to our sensations, we are to add hot or cold water, so as to bring the bath to that degree of warmth which is most grateful to our feelings.

It is better to enter the warm bath when it is too cool rather than too warm. If we enter it too warm, we lose the power of judging accurately, by our sensations, of that degree of heat which would be most pleasant at the time, and ultimately most beneficial; whereas, if we enter the bath below the proper temperature, it is easy to correct the only inconvenience that follows from this mistake.

Cases are recorded where the mistake and the injury have arisen from taking the bath at too low a temperature.

The necessity of exercise before and after the warm bath, is every day evinced, where bathing is practised; and must be held as one of those general rules from which there are very few exceptions.

Every irregular nervous action to which the human constitution is liable, is known to be influenced by the medium in which we breathe.

The valetudinarian, whose health is tolerable under the mild atmosphere of Italy, or the south of France, passes a miserable season in regions less temperate and more variable.

Hence we can reason on the effects resulting from the repeated and well regulated use of the warm bath on diseased nervous sensation.

A bath of the *same* degree of heat as the animal temperature of the person using it, will, for a few minutes after immersion, *increase* that heat very considerably; even if it be five degrees lower than the usual standard, which is 98 degrees, it will raise the animal heat to 100 degrees.

This proceeds from a cessation of the cooling process of evaporation from the skin, and the augmentation of heat occasioned by

the medium in which the body is immersed, added to what is at the same time generated internally.

This fact instructs us as to the proper mode of applying the warm bath in a variety of cases, where success depends altogether on the well regulated temperature of the bath, more particularly in nervous affections, in which the most minute attention should be paid to all the symptoms, and to the whole process of cure.

Tiberius is said to have lost his life by an improper use of the bath.

Having spoken of the proper temperature of the warm bath, we may next consider the best time for taking it.

In general, the practice, as mentioned by Plutarch, and others of the Greeks, of using the bath previous to their principal meal, which corresponded in time, nearly with our present dining honr, may be considered as preferable to any other.

Our healthy digestion has a very natural connexion with the salutary functions of the skin, and no stimulus can be so natural to it as a well regulated bath, at this particular time of the day; while the restlessness, which it often occasions when used later in the day, will be avoided.

It may sometimes be allowable to take a warm bath before breakfast, and sometimes in the evening, particularly after travelling in hot weather and dusty roads; but on most occasions the forenoon, after the morning meal is digested, is the best part of the day for bathing, whether cold or warm.

The apprehension of being chilled, and of suffering from cold by exposure to the open air, after the warm bath, is not well founded; in numberless instances the usual occupations of life are pursued through the remainder of the day, not only without injury, but with renewed animation and success.

It is true, that in rising from the warm bath, a cool air feels more chilly than the same atmosphere would do in ascending from the cold bath; and there is a rapid evaporation of heat from the skin while the body remains uncovered.

This requires, especially when the health is delicate, that the air of the apartment, when we bathe in cold weather, should be made pleasantly warm. With this precaution, and suitable clothing, there is no more danger of going into the cold air from a warm bath, than from a warm bed in a winter's morning. The body is refreshed and invigorated by heat in both cases, and thereby rendered the better able to resist cold.

Whenever I have passed a night without sleep, and been incommoded at the same time by cold, I have always, in consequence of this exposure and privation, been the more feeble and chilly the next day; and with this observation I think the general experience of every soldier and physician will accord.

I have taken the warm bath in the warmest and coldest divisions of our year, more with a view to observe its effects on my own health and sensations, than because I have needed its restorative influence at the time; and I can truly say, after bathing in both extremes of

weather, that I have been equally and uniformly less sensible of the inconvenience from heat or cold.

I have always felt more light, cheerful, and active, and more inclined, and better fitted for a full and successful employment of the powers of mind and body.

That the tendency of warm bathing is not to weaken or relax, is sufficiently proved by its exhilirating influence on those in health, as well as by its giving strength in many diseases of debility.

The utility of bathing depends also in a considerable degree on the length of time during which we remain in the bath. On this point a variety of opinions prevail, and there is some difficulty in laying down a general rule.

As the heat of the bath increases that of the person taking it, generally from five to eight degrees beyond its own temperature, if this temperature should be perfectly suited to the circumstances of the case, the pulse becomes regular, and commonly much less frequent.

These circumstances are of considerable importance in determining the proper time of continuing the bath, for we may be assured, if it should alter the tone of the circulation from a morbid to a natural state, that its ultimate effect will be of a most salutary kind; and even the refreshing feeling it gives, while we are under its direct influence, may be regarded as a warrant of the advantage to be expected.

AQUÆ DISTILLATÆ. *Distilled Waters.*

In the distillation of essential oils, the water imbibes always a part of the oil The distilled liquors here treated of, are no other than water thus impregnated with the essential oil of the subject; whatever smell, taste, or virtue, is communicated to the water, or obtained in the form of watery liquor, being found in a concentrated state in the oil.

All those vegetables, therefore, which contain an essential oil, will give over some virtue to water by distillation: but the degree of the impregnation of the water, or the quantity of water which a plant is capable of saturating with its virtue, are by no means in proportion to the quantity of its oil. The oil saturates only the water that comes over at the same time with it: if there be more oil than is sufficient for this saturation, the surplus separates, and concretes in its proper form, not miscible with the water which arises afterwards. Some odoriferous flowers, whose oil is in so small quantity that scarcely any visible mark of it appears, unless fifty or a hundred pounds or more are distilled at once, give nevertheless as strong an impregnation to water as those plants which abound most with oil.

Many have been of opinion, that distilled waters may be more and more impregnated with the virtues of the subject, and their strength increased to any assigned degree, by *cohobation*, that is, by re-distilling them repeatedly from fresh parcels of the plant. Experience, however, shows the contrary. A water skilfully drawn in the first distillation, proves on every repeated one not stronger but more disagreeable. Aqueous liquors are not capable of imbibing above a certain quantity of the volatile oil of vegetables; and this they may be made to take up by one, as well as by any number of distillations: the oftener the process is repeated, the ungrateful impression which they generally receive from the fire, even at the first time, becomes greater and greater.

Those plants, which do not yield at first waters sufficiently strong, are not proper subjects for this process.

Most distilled waters, when first prepared, have a somewhat unpleasant smell, which, however, they gradually lose: it is therefore advisable to keep them for some days after their preparation in vessels but slightly covered; and not to cork them up until they lose that smell.

That the waters may keep the better, about one-twentieth part their weight of proof spirit may be added to each after they are distilled. A respectable apothecary informed Dr. Duncan, that if the simple distilled waters be rectified by distilling them a second time, they will keep for several years without the addition of any spirit, which always gives an unpleasant flavour, and is often objectionable for other reasons.

Distilled waters are employed chiefly as grateful diluents, as suitable vehicles for medicines of greater efficacy, or for rendering disgustful ones more acceptable to the palate and stomach: few are depended on, with any intention of consequence, by themselves.

These waters may be prepared extemporaneously, by adding to water what have been called essences, (that is, the essential oil dissolved in alcohol,) or by rubbing any essential oil with ten times its weight of sugar, or what is said to be better, *Magnesia.* As thus prepared, they do not retain their transparency.

The waters are to be distilled from the dried herbs, unless otherwise ordered, because they are not to be had fresh at all times of the year. If used fresh, their weight is to be doubled.

To every pint of these waters add half an ounce measure of proof spirit to preserve them, and keep in close stopped vessels.—*Dublin Pharmacopœia.*

From amongst the number of distilled waters recommended by the foreign Pharmacopœias, the *National Pharmacopœia* has selected the following:

Aqua Aurantii Corticis. *A. E.* *Water of Orange Peel.*

Take of

Fresh orange peel, two pounds.

Pour upon it enough water to prevent empyreuma, and after due maceration distil ten pints.

In the same manner are prepared

Aqua Cinnamomi. *A. L.* *Cinnamon Water.*

From a pound of bruised cinnamon.

Aqua Menthæ Piperitæ. *A. E.* *Peppermint Water.*

From three pounds of peppermint in flower.

Aqua Menthæ Viridis. *A.* *Spearmint Water.*

From three pounds of spearmint in flower.

Aqua Rosarum. *A. E.* *Rose Water.*

From six pounds of fresh roses.

The National Pharmacopœia has introduced into its pages a new set of waters, under the title of

AQUÆ MEDICATÆ. *MEDICATED WATERS.*

These are

Aqua Acidi Carbonici.

Carbonic Acid Water, or Seltzer Water.

Made by impregnating any quantity of water with about ten times its volume of carbonic acid gas, by means of a forcing pump.

It is obvious that the name of Seltzer water is altogether inappropriate, for independently of the excessive amount of carbonic acid thus forced in, we find, under the analysis of the water of this celebrated spring, that two pints and three-quarters contain

Carbonic acid, ...	60	cubic inches.
Carbonat of lime, ...	17	grains.
——— of magnesia, . .	29.5	
——— of soda, ...	24	
Muriat of soda, ...	109.5	

This great difference was certainly deserving of notice.

As every person, especially in the country, has not access to the mineral waters so largely prepared in the city, &c. the following formula of the Dublin College will not be misplaced.

Aqua Æris Fixi. *D.* *Water impregnated with Fixed Air.*

Take of
White marble in powder, ... three ounces;
Diluted sulphuric acid and water, of each, . . a pound and a half.
Mix them gradually in a Nooth's apparatus, and let the air evolved pass through six pounds of pure spring water, placed in the upper part of the apparatus; and let agitation be occasionally employed until the water shall have acquired a sub-acid taste. *D.*

Carbonic acid may be separated from carbonat of lime
a. By the action of heat alone.
b. By an acid having a superior affinity for the lime.

In the former way the carbonic acid is perfectly pure, in the latter it carries over a little of the stronger acid, which gives a slight degree of pungency.

In this process the carbonic acid is separated from the carbonat of lime by the superior affinity of sulphuric acid. As it is disengaged, it assumes a gaseous form, and would be dissipated in the atmosphere, if it were not made to pass through water, which, at a medium temperature, is capable of absorbing about an equal bulk of this gas, and, by the assistance of pressure, a much greater proportion.

Various contrivances have been made for this purpose. Of these the most easily managed, and most convenient for general use, is the apparatus of Nooth; and, for larger quantities, that of Woulfe, or some modification of it. By the proper application of pressure, M. Paul of Geneva, now of London, is able to impregnate water with no less than six times its bulk of carbonic acid gas.

Medical use.—Water impregnated with carbonic acid, sparkles in the glass, has a pleasant acidulous taste, and forms an excellent beverage. It diminishes thirst, lessens the morbid heat of the body, and acts as a powerful diuretic. It is also an excellent remedy in increased irritaiblity of the stomach, as in advanced pregnancy; and it is one of the best anti-emetics which we possess.

The National Pharmacopœia gives a process for procuring the carbonic acid, which, in point of fact, resembles the above; but the operator is not directed in what to receive the gas, nor in any particular which is of importance to be known.

Aqua Magnesiæ. *A.*

Magnesia Water, commonly called Liquid Magnesia.

This is made by adding three drachms of carbonat of magnesia to one gallon of water, and impregnating it as in making the simple carbonic acid water.

It must be obvious, that if the common name of *liquid magnesia* is incorrect, that adopted by the United States' Pharmacopœia is infinitely more so; if any thing, it is a solution of supercarbonated magnesia.

Aqua Potassæ. *A.* *Potass Water!!*

Prepared in like manner from one ounce of subcarbonat of potass. What will the European chemists say to this name! and how are we now to distinguish a solution of caustic potash from this solution of supercarbonated potass?

Aqua Sodæ. *A.* *Soda Water!!*

From two ounces of subcarbonat of soda.

The same questions here present themselves!

It will undoubtedly be said, that the names were adapted to those in *common use;* but how does it agree with the declaration in the preface of their work, that "in the nomenclature of chemical substances, the convention have followed the modern language of chemistry, as it is most generally received at the present day." (p. 25.) We presume it is the language of chemistry *as received by chemists,* that is meant. What do *chemists* mean by Aqua Potassæ! and Aqua Sodæ! certainly not those articles to which the convention have appropriated these names in this place, (p. 82.) We shall find that the convention have another *Aqua Potassæ* at page 188 of the Pharmacopœia! Suppose the apothecary to give this last as a beverage in place of the former! He would certainly have a right to adduce that work in his justification!!

It is impossible not to advert here to the imperfection of the directions. The processes never having been detailed in a pharmacopœia, it was incumbent on the convention, when it agreed to receive them, to give minute instructions how they were to be carried into effect. No one, not already acquainted with the process, will be a jot the wiser for the directions of the Pharmacopœia.

ARALIA NUDICAULIS. *A.* (*Secondary.*)

False Sarsaparilla. The Root.

Pentandria Pentagynia. Nuttall.

Of its virtues we are not informed. It is not noticed in either of the works on Medical Botany by professors Bigelow and Barton.

Dr. Mease, in the second volume of the Philadelphia Medical Museum, recommends the roots as a substitute for sarsaparilla.

A watery infusion, he tells us, is employed in some parts of this country for the shingles.

It is useful also as a tonic, in a relaxed state of the stomach with loss of appetite.

Although this information may entitle it to a place in a general collection of the Materia Medica, it is scarcely sufficient to warrant its introduction even into the secondary lists of a National Pharmacopœia.

ARALIA SPINOSA. *A.* (*Secondary.*)

Angelica tree, Prickly Ash, Tooth-ach tree. The Bark.

This is a native of Virginia, and other southern states. The height to which this tree will grow, when the soil and situation wholly agree with it, is about twelve feet. It is a very ornamental shrub, and the stem, which is of a dark brown colour, is defended by sharp prickly spines.

In the second volume of the Philadelphia Medical Museum, p. 161, Dr. Mease recommends a watery infusion of the inner bark and root to remove the pains of chronic rheumatism. It is considerably acrimonious, and affects the salivary glands. A weak infusion proves sudorific, and does not nauseate, which a strong one generally does.

The berries, and a tincture of them, have been successfully applied to obviate the aching of decayed teeth. A spiritous infusion of the berries is employed in Virginia in violent colic.

ARCTIUM LAPPA. *E. D.* *Burdock. Clit-Bur. The Root.*

This is a perennial plant, which grows wild in uncultivated places. The seeds have a bitterish sub-acrid taste: they are recommended as very efficacious diuretics, given either in the form of emulsion, or in powder, to the quantity of a drachm. The roots taste sweetish, with a slight austerity and bitterishness: they are esteemed aperient, diuretic and sudorific; and are said to act without irritation, so as to be safely ventured upon in acute disorders. Decoctions of them have of late been used in rheumatic, gouty, venereal, and other disorders: and are preferred by some to those of sarsaparilla.

ARGENTUM. *A. E. L. D.—SILVER.*

Silver Leaf.

Silver is very brilliant, white, insipid, inodorous; specific gravity 10.474 to 11.091; hardness between iron and gold; elasticity between gold and copper; has a strong acute sound; of considerable ductility and tenacity; hardening much under the hammer; a good conductor of electricity, caloric, and galvanism; fusible at 28° Wedgwood; crystallizable by cooling; unalterable in the air; changed into a greenish oxyd by long and violent heat, burning with a greenish flame, and instantly by the electric shock. Its phosphuret is granulated, brittle and fusible; its sulphuret grey, black, lamellated or

striated and fusible; it unites but slightly with the acidifiable metals and iron; is hardened by gold, bismuth, antimony, tin, lead, and copper, and amalgamates with mercury. It is oxydized, and dissolved by the sulphuric, sulphurous, and nitric acids, and combines with chlorine. Its oxyd is olive; reducible by light and heat, hydrogen, and the metals; it colours some glasses of an olive green, and is very soluble in ammonia.

Silver is found,
I. In its metallic state:
1. Pure.
2. Alloyed with gold. Auriferous silver ore.
3. ———— antimony.
4. ———— iron and arsenic.
5. ———— bismuth.

II. Combined with sulphur:
1. Sulphureted silver. Vitreous silver ore.
2. ———— with antimony, iron, arsenic and copper. Black or brittle silver ore.
3. ———— with copper and antimony. Black silver ore.
4. ———— with lead and antimony. White silver ore.

III. Oxydized:
1. Combined with carbonic acid and antimony.
2. ———— muriatic acid.
a. Corneous silver ore,
b. Earthy silver ore,
c. Sooty silver ore.
3. Combined with sulphur and oxyd of antimony. Red silver ore.
4. ———— molybdic acid.

ARGENTI NITRAS. *A.* NITRAS ARGENTI. *E. L. D.*

Fused Nitrat of Silver. Lunar Caustic.

Take of
Pure silver, flattened into plates, and cut into pieces, one ounce;
Nitric acid, ... one fluid ounce;
Distilled water, ... two fluid ounces.

Mix the nitric acid and water, and dissolve the silver therein on a sand bath; then increase the heat gradually that the nitrat of silver may be dried. Melt the salt in a crucible over a slow fire, until the water being evaporated, it ceases to boil, and the mass flows like oil; then pour it quickly into moulds of convenient shape. Lastly, keep it in a glass vessel very well stopped, and secured from light.

The acid employed must be very pure. If it contain, as the acid of commerce always does, sulphuric or muriatic acid, these re-act upon the nitrat as soon as it is formed, and a white precipitate, consisting of sulphat and muriat of silver, falls to the bottom.

The method which the refiners employ for examining the purity of their aquafortis (the name they gave to diluted nitrous acid,) and purifying it if necessary, is to let fall into it a few drops of a solution of nitrat of silver already made: if the liquor remain clear, it is fit for use; otherwise, they add a small quantity more of the solution, which immediately turns the whole to a milky white colour; the mixture being then suffered to rest for some time, deposites a white sediment; from which it is cautiously decanted, examined again, and, if necessary, farther purified by a fresh addition of this solution.

It is necessary to employ very pure water in this process, for the muriats and earthy salts which common water generally contains, precipitate part of the silver in a state of a muriat or oxyd. If distilled water be not used, the water should be added to the acid before it be tried and purified by the nitrat of silver.

The solution will go on the more speedily, if the silver, flatted into thin plates, be rolled loosely up, so that the several surfaces do not touch each other. By this management, a greater extent of the surface is exposed to the action of the menstruum, than when the plates are cut in pieces and laid above each other. If the silver be alloyed with copper, the solution will have a permanent greenish blue colour, and acquire a bright blue on the addition of ammonia. If it contain gold, the gold is not dissolved, but is found at the bottom of the solution, in the form of a black or deep purple powder.

The crucible ought to be of porcelain; as, with the common crucibles, the loss arising from the nitrat of silver sinking into their substance is too great. It ought also to be large enough to hold five or six times the quantity of the dry matter; for it bubbles and swells up greatly, so as otherwise to be apt to run over. During this time, also, little drops are now and then spirted up; whose causticity is increased by their heat, against which the operator ought therefore to be on his guard. The fire must be kept moderate till this ebullition ceases, and till the matter becomes consistent in the heat that made it boil before: then quickly increase the fire till the matter flows thin at the bottom like oil, on which it is to be immediately poured into the mould; for if the heat be continued after this, the nitrat of silver begins to be decomposed, and the silver is reduced.

In want of a proper iron mould, one may be formed of tempered tobacco pipe clay, not too moist, by making, in a lump of it, with a smooth stick, first greased, as many holes as there is occasion for: pour the liquid matter into these cavities, and when congealed take it out by breaking the mould. Each piece is to be wiped clean from the grease, and wrapt up in soft dry paper, not only to keep the air from acting upon it, but likewise to prevent its corroding or discolouring the fingers in handling.

Nitrat of silver is crystallizable. Its crystals are brilliant plates,

having a variable number of sides. Their taste is austere, and intensely bitter. They are very soluble in water, but permanent in the air, and not deliquescent. They are decomposed by heat, light, phosphorus, charcoal, many metals, all the alkalies and earths, sulphuric, muriatic, phosphoric and fluoric acids, and by the salts they form. When deprived of water, and melted according to the directions of the colleges, it forms a black or dark grey coloured mass, which, when broken, appears to consist of radii, diverging from the centre. It is not deliquescent when free from copper, which is seldom the case. It may, however, be prepared perfectly pure, even from a solution containing copper, by evaporating and crystallizing it as long as it furnishes firm tabular crystals. These are then to be washed with a little distilled water, and melted with a gentle heat. The nitrat of copper remains in the mother water, and the silver, which it contains, may be precipitated with muriatic acid.

Its composition is 70 oxyd of silver, and 30 nitric acid. Soluble in an equal weight of water at 60°, also in alcohol. In using it, the following substances are incompatible: fixed alkalies and alkaline earths; muriatic, sulphuric, and tartaric acids, and their salts; soaps, arsenic, hydro-sulphurets, astringent vegetable infusions, and undistilled waters. Ammonia forms with it a very soluble salt, the ammoniaco-nitrat of silver, which will be noticed under arsenic.

Nitrat of silver stains animal substances, &c. of an indelible black, and is employed as the basis of the permanent ink, for marking linen.*

Medical use.—It has been considered as tonic, and antispasmodic, and is much and deservedly celebrated as a manageable and efficacious caustic or escharotic for fungous excrescences, callous edges, warts, strictures in the urethra, &c. When the article is not at hand, an extemporaneous substitute may be formed by dipping the point of a probe, or any piece of silver into nitric acid, and applying it to the part.

Internally taken, it has been much spoken of by many physicians in epilepsy, angina pectoris, and other diseases; but, whether the doses now given, compared to those of former times (one-sixth of a grain, to six grains and more,) are too small to be effectual, it certainly does not appear to deserve what has been said of it. It is highly probable, I think, that it is altogether undeserving of a place among our means of cure, when it is considered how readily it is decomposed by the fluids it meets with in the stomach. Muriatic and phosphoric acids are generally there present, which instantly form insoluble salts, which may be regarded as inert. That it does, however, pass the route of the circulation in some shape, seems evident, since its long continued use has given rise to a purple hue, of a very

* This preparation consists of a solution of nitrat of silver, thickened with sap-green or cochineal. The preparing liquid for wetting the linen previously, is a solution of carbonat of soda boiled with gum, or some animal mucilage. If *potash* is used for this purpose, the ink will run.

singular appearance, on the surface of the patient; several cases of which are recorded.*

Upon the whole, I am fully of opinion, that we have no sufficient facts in relation to it, to establish its claim to internal use. If any apparent benefit has attended its employment, I am more disposed to ascribe it to the salts which have arisen from its decomposition, and would suggest the propriety of ascertaining the merits of the muriat and phosphat of this metal.

ARNICA. *A.* *Leopard's-bane.* (*Secondary.*) *The Plant.*

Arnica Montana. *E. D.* *Flowers and Root.*

Leopard's-bane is a very common perennial plant in the alpine parts of Germany, Sweden, Lapland, and Switzerland. The flowers, which are of a yellow colour and compound, consisting entirely of tubular florets, are distinguished from similar flowers, with which they are often mixed, from ignorance or fraud, by the common calyx, which is shorter than the florets, and consists entirely of lancet-shaped scales, lying parallel and close to each other, of a green colour, with purple points. The calyx of the different species of Inula are composed of bristle-shaped scales, reflected at the points, and beset with hairs. The florets of the genus Hypochæris are strap-shaped.

These flowers have a weak bitterish taste, evidently combined with a degree of acrimony, and when rubbed with the fingers, have a somewhat aromatic smell. Their active constituents are not sufficiently ascertained.

Mercier has endeavoured to show, that they owe their acrimony to the agency of insects upon them; and that naturally, they contain aromatic principle and modified tannin; but in their ordinary state they contain also an acrid resin, and an unexamined peculiar vegetable principle, as pointed out by Weber. We may judge what dependance is to be placed on the different analyses of vegetables, by what is said above, as in the former editions of Duncan's Dispensatory, we are told, " They *evidently* contain a great deal of resin, and some essential oil, and Bouillon Lagrange says, uncombined gallic acid."!

Medical use.—In their effects they are stimulating, and supposed to be discutient. In small doses, and properly administered, they possess very beneficial effects, in raising the pulse, in exciting the action of the whole sanguiferous system, in checking diarrhœas, in promoting expectoration, and, most particularly, in removing paralytic affections of the voluntary muscles; but their use is frequently

* Eclectic Repertory, vol. vii. 206, &c. In this volume may also be seen an account of a patient, who in two years and a half took no less than thirty-three drachms and a half.

attended with no sensible operation, except that in some cases of paralysis, the cure is said to be preceded by a peculiar prickling, and by shooting pains in the affected parts. When given improperly, or in too large doses, they excite an insupportable degree of anxiety, shooting and burning pains, and even dangerous hæmorrhages, vomiting, vertigo, and coma. For these dangerous symptoms, vinegar is said to be the best remedy.

They have been recommended,

1. In paralytic disorders, in chronic rheumatism, in retention of the urine from paralysis of the bladder, in amaurosis.
2. In intermittent fevers, combined with Peruvian bark.
3. In dysentery and diarrhœa, but in some cases they have had bad effects.
4. In putrid diseases.
5. In typhoid inflammations.
6. To promote the uterine discharge.
7. And in internal pains, and congestions from bruises. In the countries where they are indigenous, the flowers of the leopard's-bane have long been a popular remedy in these accidents.

They are contra-indicated by an inflammatory diathesis, a predisposition to hæmorrhages, and internal congestions.

They are best exhibited in the form of infusion. One or two scruples may be infused with half a pound of water, and drunk at proper intervals. The flowers should be wrapt up in a piece of linen, as otherwise their down is apt to be diffused in the liquid, and to cause violent irritation of the throat.

The dried root of this plant is about the thickness of a small quill, and sends out fibres along one side. Externally it is rough, and of a red-brown colour, internally of a dirty white. Its taste is acrid, and slightly bitter. Neumann extracted from 960 parts, 840 watery extract, and 5 alcoholic, and inversely 270 alcoholic, and 540 watery.

Medical use.—It is exhibited in the same manner and circumstances as the flowers, but it is more apt to excite vomiting. In powder its dose is from five to ten grains.

ARSENICUM.—*ARSENIC.*

Arsenic consists of grey plates of a lively brightness; friable; specific gravity between 8.310 and 5.703; vaporizable at 540°; emitting a smell like garlic; crystallizable; oxydizable in the cold air; inflammable at a red heat, and sublimed in the form of a white oxyd or acid; farther oxydizable by the nitric and nitrous acids; combines with phosphorus, sulphur, and many of the metals; soluble in hydrogen gas.

Arsenic is found,

I. In its metallic state:

1. Alloyed with iron. Native arsenic.
2. ———— iron and gold.
3. ———— cobalt.
4. Combined with iron and sulphur. Arsenical pyrites.
5. Combined with iron, sulphur and silver. White arsenical pyrites.

II. Oxydized:

1. Uncombined. White oxyd of arsenic. Arsenous acid.
2. Combined with sulphur:
   a. Oxyd of arsenic 90, sulphur 10, Orpiment. Yellow sulphureted arsenic.
   b. Oxyd of arsenic 84, sulphur 16, Realgar. Red sulphureted arsenic.

III. Acidified and combined,

1. With lime.
2. With copper.
3. With iron.
4. With cobalt.

Forming the arseniats of those substances.

ACIDUM ARSENIOSUM. *A.*

Arsenious Acid, called White Arsenic.

Oxydum Arsenici. *E.* Arsenici Oxydum. *L.* Arsenicum. *D.*

Arsenic. White oxyd of Arsenic. Arsenous Acid. Rats-bane, &c. &c.

This substance, which was formerly named, improperly, arsenic, is most generally obtained in the process of roasting the ores of cobalt in Saxony. The roasting is performed in a kind of reverberatory furnace, with which a very long chimney is connected, lying in a horizontal direction. The arsenous acid is condensed in it in the form of a loose grey powder, which, by a second sublimation with a little potass, and in a great degree of heat, coalesces into a firm vitreous sublimate, which gradually becomes opaque by exposure to the air. In this state it is the white arsenic of commerce, or, as it should be termed, the arsenous acid. For internal use, the lumps of a shining appearance and dazzling whiteness should be chosen; but it is generally offered for sale in the form of powder, which is very often mixed with chalk or gypsum. The fraud is easily detected by exposing it to heat. The arsenous acid is entirely sublimed, and the additions remain behind.

As this substance is one of the most virulent of poisons, it is essential to enter minutely into its consideration; and this will, with some trifling additions and modifications, be taken from the Pharmacologia of Dr. Paris.

Qualities.—Form. Shining white semivitreous lumps, breaking with a conchoidal fracture, and when reduced to powder, bearing some resemblance to white sugar; *Taste* acrid and corrosive, leaving an impression of sweetness. *Specific gravity* 5; it is volatilized at the temperature of 383 Fahr. and in the state of vapour is quite inodorous, although it is asserted in many chemical works of authority to yield a smell like that of garlic; the fact is that the alliaceous or garlic-like smell is wholly confined to *metallic* arsenic in a state of vapour, and whenever the arsenous acid yields this odour, we may infer that its decomposition has taken place; this happens when it is projected upon ignited charcoal, or when heated in contact with those metallic bodies which readily unite with oxygen, as *antimony* and *tin.* It is stated by Orfila and other chemists, that if it be projected upon heated copper the alliaceous odour is evolved; this however takes place only when the copper is in a state of ignition, at which temperature its affinity for oxygen enables it to reduce the arsenous acid, for Dr. Paris found by experiment that if a few grains of this substance be heated on a plate of copper, by means of a spirit-lamp or blowpipe, no odour is perceptible, for the whole of the acid is dissipated before the copper can acquire a sufficiently exalted temperature to deoxydize it. If the arsenous acid be heated on a plate of zinc, the smell is not evolved until the metal is in the state of fusion; if instead of these metals we employ in our experiments those of gold, silver, or platina, no alliaceous smell whatever is produced, at any temperature. It is probable that arsenical vapours which yield this peculiar odour are less noxious than those which are inodorous, but Dr. Paris was not aware that the knowledge of this fact can be applied to any purpose of practical importance.

Chemical Composition.—This substance possesses many of the essential habitudes of an acid, as for instance, that of combining with the pure alkalies to saturation; it is therefore very properly denominated *Arsenous Acid.* It may be further acidified by distilling it with nitrous acid, and the compound which results is a white concrete substance, termed *Arsenic Acid;* from experiments on the quantity of oxygen absorbed by metallic arsenic, during its conversion into these two compounds, instituted by Proust and Davy, it appears that the *arsenous* acid consists of about 25 of oxygen and 75 of metal, and the *arsenic* acid of 33 of oxygen, and 67 of metal, or the quantity of metal being the same, that the oxygen in the latter compound is to that in the former nearly as three to two.

Solubility.—We have but lately been set right upon this point. Klaproth has shown that it requires for its solution 400 parts of water at 60°, and only 13 at 212°, and moreover, that if 100 parts of water be boiled on the arsenous acid, and suffered to cool, it will retain three grains in solution, and deposite the remainder in tetrahedral crystals; this fact shows the importance of employing boiling water in every chemical examination of substances supposed to contain arsenic acid. It is soluble in alcohol and oils; with lime water it produces a white precipitate of *arsenite of lime,* which is soluble in

an excess of arsenous acid; with magnesia it forms a soluble *arsenite,* which proves very virulent. Arsenous acid is every day the instrument of death in the hands of wickedness or imprudence. It is sometimes mistaken for sugar, and with dreadful consequences.

The symptoms which characterize this poison, are a great constriction of the throat, the teeth set on edge, the mouth strongly heated, involuntary spitting, with extreme pain of the stomach, vomiting of glairy and bloody matter, cold sweats, convulsions and death.

On dissection, the stomach and bowels are found inflamed, gangrenous, and corroded, and the blood is fluid. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, the epidermis separates, and the whole body becomes very speedily putrid. When the quantity is insufficient to produce death, tremors, palsies, and lingering hectics succeed.

It may be interesting and useful to record an account of the pernicious influence of arsenical fumes upon organized beings, as Dr. Paris has been enabled to ascertain in the copper smelting works of Cornwall and Wales; this influence is very apparent in the condition both of the animals and vegetables in the vicinity; horses and cows commonly lose their hoofs, and the latter are often to be seen in the neighbouring pastures crawling on their knees and not unfrequently suffering from a cancerous affection in their rumps, whilst the milch cows, in addition to these miseries, are soon deprived of their milk; the men employed in the works are more healthy than we could *à priori* have supposed possible; the antidote upon which they all rely with confidence, whenever they are infected with more than an ordinary portion of arsenical vapour, is *sweet oil,* and an annual sum is allowed by the proprietors in order that it may be constantly supplied; this opinion is not solitary, for Tachenius relates that the poisonous effects, such as convulsions, gripes, and bloody stools, with which he was seized from exposure to the fumes of arsenic, were relieved by milk and oil.

It deserves notice, that the smelters are occasionally affected with a cancerous disease in the scrotum, similar to that which infests chimney-sweepers, and it is singular that Stahl, in describing the putrescent tendency in the bodies of those who die from this poison, mentions in particular the gangrenous appearance of those parts. It is a very extraordinary fact, that previous to the establishment of the copper works in Cornwall, the marshes in their vicinity were continually exciting intermittent fever, whereas, since that period, a case of ague has not occurred in the neighbourhood; Dr. Paris has heard it remarked by men in the works, that the smoke *kills* all fevers. The fact is here stated without any other comment than that the agricultural improvements which have taken place in the district, are not sufficient to afford any clue to the explanation of the circumstance.

Medical uses.—Much has been said upon this subject, and the propriety and safety of its exhibition has been often questioned; there can be no doubt but that the greatest circumspection is required in

the practitioner who administers it; the form in which it is most manageable and least dangerous, is that of solution. Some practitioners have exhibited it in substance, made into pills, by rubbing one grain with ten of sugar, and then beating the mixture with a sufficient quantity of crumb of bread to form ten pills, one of which is a dose. The Chinese and other oriental nations form the sulphuret of arsenic (*realgar*) into medical cups, and use lemon juice, after it has stood some hours in them, by way of a cathartic. As an external application, arsenic has long been extolled in the cure of cancers.*

Antidotes.—Late researches have shown that *sulphuret of potass,* on which physicians have made so much reliance, merits no confidence. The great indication to be fulfilled in all cases of poisoning is to excite vomiting, and to administer mucilaginous or other liquids, which are the least liable to act as solvents of the acrid matter, on which account, Dr. Paris thinks lime water presents itself as a very appropriate fluid.

Methods of detecting the presence of Arsenous Acid.

1. *By its reduction to a metallic state.* Mix a portion of the suspected powder with three times its weight of *black flux* (consisting of finely powdered charcoal one part, dry carbonat of potass two parts,) put the mixture in a thin glass tube, hermetically closed at one end, about eight inches in length, and one fourth of an inch in diameter; should any of the powder adhere to the sides of the tube, it must be carefully brushed off with a feather, so that the inner surface of its upper part may be perfectly clean and dry; the closed end of the tube, by way of security, may be thinly coated with a mixture of pipe clay and sand, but this operation is not absolutely necessary; the open extremity is to be closely plugged with a piece of paper; the coated end must be now heated on a chafing dish of red hot coals, when the arsenic, if present, will sublime, and be found lining with a brilliant metallic crust the upper part of the tube; a portion of this reduced metal, if it be arsenic, will, when placed on heated iron, exhale in dense fumes which are characterized by a strong smell of garlic.

It merits particular notice, that in reducing by the above process the arsenous acid to the state of metal, the presence of potass in the flux is very essential, since it forms immediately an *arsenite of potass*, and thereby fixes the arsenous acid, and prevents it from being volatilized before the temperature is sufficiently high to enable the charcoal to decompose it; an ignorance of this fact has not unfrequently proved a source of disappointment and fallacy.

Another method of identifying *white arsenic* by metallization, is to form, at the moment of its reduction, an alloy with copper; this is easily effected in the following manner. Mix the suspected powder

* It is used by dyers, as a flux in glass making, in docimastic works, and in some glazes, &c.; and it forms the basis of almost all the quack remedies for cancer.

with black flux, as in the former experiment, and place the mixture between two polished plates of copper, bind them tight together by iron wire, and expose them to a low red heat; if the included substance contained arsenic, a silvery white stain will be left on the surface of the copper, which is an alloy of the two metals. If in this, as in the former experiment, charcoal be employed without the addition of a fixed alkali, the result may, for the same reason which it is needless to repeat, prove unsatisfactory.

2. *By the application of certain Re-agents, or Tests, to its Solutions.*

A great and important question has arisen in medical jurisprudence, whether any chemical proofs of the presence of *white arsenic,* short of its actual reduction to the state of metal, can be depended upon, or ought to be received as evidence in the courts of criminal law. After a full experimental investigation of the subject, and an impartial review of all the facts which bear upon the question, Dr. Paris feels no hesitation in declaring it to be his conviction, that *white arsenic may be detected without any fear of fallacy, by a proper application of certain tests,* and that the contrary opinion is entirely founded in error, and unsupported by experiment, as will more fully appear in the sequel.

(A.) *Fused Nitrat of Silver,* or *Lunar Caustic.*—For this test we are indebted to Mr. Hume, of London, who first gave it to the public in the Philosophical Magazine for May, 1809, vol. xxxiii. His method of applying it is as follows: Into a clean Florence flask introduce two or three grains of the suspected powder, to which add about eight ounces of rain or distilled water, and heat the solution until it begins to boil, then while it boils frequently shake the flask, and add to the hot solution a grain or two of sub-carbonat of potass, agitating the whole to make the mixture uniform. Pour into a wine glass about two table-spoonsful of the solution, and touch the surface of the fluid with lunar caustic. If arsenic be present, a beautiful yellow precipitate will instantly proceed from the point of contact, and settle to the bottom of the glass as a flocculent and copious precipitate.

By this test the 60th part of a grain may be satisfactorily recognised in two ounces of water. The presence of some alkali is essential to the success of the experiment, since arsenous acid is unable by the operation of simple affinity to decompose the nitrat of silver.* The validity of this test has been questioned on the following grounds, which shall be fairly examined in order.

Objection 1. *The Alkaline Phosphats are found to produce precipitates with silver, analogous in colour and appearance to the arsenite of silver.* This is undoubtedly the case when the experiment is per-

* If any trifling opacity occur in a simple solution of arsenic, when assayed by the nitrat of silver, it may be considered as the effects of some casual impurities; this is further demonstrated by bringing over the surface of the arsenical liquid, a piece of blotting paper, or a stopper, moistened with a solution of ammonia, when there will instantly form a copious yellow precipitate of arsenite of silver.

formed in the manner just stated, but there are other re-agents which will immediately distinguish these bodies, as will be seen under the history of the *Ammoniaco-nitrat of silver*. Dr. Paris has also shown that there is a mode of modifying the application of the silver test itself, that no error or doubt can arise in the use of it from the presence of the phosphoric salts.* His method consists in conducting the trial on writing paper, instead of in glasses; thus, drop the suspected fluid on a piece of white paper, making with it a broad line; along this line a stick of lunar caustic is to be slowly drawn several times successively, when a streak is produced of a colour resembling that known by the name of *Indian Yellow;* and this is equally produced by the presence of arsenic, and that of an alkaline phosphat, but the one from arsenic is rough, curdy, and flocculent, as if effected by a crayon, that from a phosphat homogeneous and uniform, resembling a water colour laid smoothly on with a brush: but a more important, and distinctive peculiarity soon succeeds, for in less than two minutes the phosphoric yellow fades into a *sad green*, and becomes gradually darker, and ultimately quite black; while on the other hand, the arsenical yellow remains permanent, or nearly so, for some time, when it becomes brown. In performing this experiment, the sun-shine should be avoided, or the transitions of the colour will take place too rapidly. It would be prudent also for the inexperienced operator to perform a similar experiment on one fluid known to contain arsenic, and on another with a phosphoric salt, as a standard of comparison. In this way the nitrat of silver, without the intervention of any other test, is fully capable of removing every ambiguity, and of furnishing a distinguishing mark of difference between the chemical action of arsenic and the phosphats. Mr. Hume states, that he has repeated this experiment to his entire satisfaction,† and that, in a late unfortunate case of poisoning, he derived considerable information by its application. The laborious author of the London Dispensatory accepts it as an excellent test, but observes that it is rendered more luminous by brushing the streak lightly over with liquid ammonia immediately after the application of the caustic, when, if the arsenic be present, a bright queen's yellow is produced, which remains permanent for nearly an hour: but when the lunar caustic produces a white-yellow before the ammonia is applied, we may infer the presence of some alkaline phosphat, rather than that of arsenic. One of the great advantages of this test, is the very small quantity that is required for examination; it would be well therefore for the operator to perform the experiment in both ways on a separate paper.

Objection 2. *The Muriats produce precipitates with silver so copious and flocculent, as to overcome every indication which the presence of arsenic would otherwise afford.* Dr. Marcet proposes to obviate this difficulty, by adding to the fluid to be examined, dilute nitric acid, and then cautiously to apply the nitrat of silver, until the precipitation ceases; in this way the muriatic acid will be entirely

* Annals of Philosophy, vol. x. p. 69.

† London Medical and Physical Journal, January, 1818.

removed, whilst the arsenic, if it be present, will remain in solution, and may be rendered evident by the affusion of ammonia, which will instantly produce the yellow precipitate in its characteristic form. This mode, however, it must be confessed appears complicated, and requires some chemical address for its accomplishment; it should be also known, that the yellow precipitate thus produced, is not always permanent, for it is soluble in the nitrat of ammonia formed during the process. Under these circumstances, it is surely preferable to precipitate at once from the suspected fluid all the substances which nitrat of silver can effect, and then to expose the mixed and ambiguous precipitate so obtained, to a low heat in a glass tube, when the arsenous acid will be immediately separated by sublimation; in this way the presence of muriats may even in certain cases be serviceable, especially if the quantity of arsenic be minute, for by increasing the bulk of the precipitate, we shall decrease the difficulty of its examination. By this process, Dr. Paris would also propose to meet the embarrassments which are stated to arise from the influence of various animal and vegetable substances, as milk, broth, wine, &c., so frequently present in the suspected liquid, and which are known to alter the character of the arsenical indications.

It has been stated that in consequence of the inability of arsenous acid to decompose nitrat of silver by simple elective attraction, the presence of an alkali becomes indispensable in the examination, for which purpose Dr. Marcet has suggested the superior advantages which will attend the use of ammonia in cases where the arsenic has not been previously combined with a fixed alkali, since it does not, when added singly, decompose nitrat of silver, a circumstance which in using the fixed alkalies is very liable to occasion fallacy. This led Mr. Hume to improve his original plan, by forming at once a triple compound, an *ammoniaco-nitrat of silver*,* which is a triumph in the art of analysis, for whilst it obviates the necessity of ascertaining the exact proportion of alkali required in each experiment,† it possesses the valuable property of not in the least disturbing the phosphat of soda.

(B.) *Sulphat of Copper.* Like the preceding test, this requires also for its success, that the arsenous acid should be combined with some alkali, in which case, by the operation of double elective attraction, an arsenite of copper is thrown down of a very striking and characteristic colour, being that of the well known pigment called *Scheele's green;* if arsenic be not present in the liquid so assayed,

* The following is the formula for its preparation. Dissolve ten grains of lunar caustic in ten times its weight of distilled water, to this add, *guttatim*, liquid ammonia, until a precipitate is formed: continue cautiously to add the ammonia, repeatedly agitating the mixture until the precipitate is nearly re-dissolved. The object of allowing a small portion to remain undissolved is to guard against an excess of ammonia. Wherever the test is used, the liquid to which it is added ought to be quite cold.

† This is very important, for an excess of ammonia re-dissolves the yellow precipitate, and therefore defeats the object of the test. The fixed alkalies, in excess, have not such a property.

and a fixed alkali has been employed, the result will be a delicate *sky blue*, instead of the *grass green* precipitate.*

Mr. Hume avails himself also of the peculiar property of ammonia to form a triple metallic salt, and has employed it with copper: he takes the sulphat or acetat of that metal, and by the same process forms another test. In using this, however, care must be taken that it be not too highly concentrated, for in that state, it will not produce precipitation.† Much controversy has taken place on the subject of sulphat of copper as a test for arsenic, and it has been stated with more confidence than truth, that a *decoction of onions* has the property of imparting to the copper precipitate, which is produced by a fixed alkali, a colour and appearance analogous to that which is occasioned by arsenic. This opinion was boldly advanced and supported on a most important trial at the Lent assizes for Cornwall, in 1817. Since this event, an opportunity has occurred which has enabled Dr. Paris to examine this alleged fact, by a fair and appropriate series of experiments, the result of which satisfactorily proved, that the opinion was founded on an optical fallacy, arising from the *blue* precipitate assuming a *green* colour, in consequence of having been viewed through a yellow medium. The phosphoric salts may also, under similar circumstances, be mistaken for arsenic, for the intense blue colour of the phosphat of copper will thus necessarily appear green. This instance of optical fallacy is not solitary, for *corrosive sublimate* has been said to possess the character of an alkali because it turns the syrup of violets green, whereas this change is to be attributed solely to the combination of the yellow hue of the sublimate with the blue colour of the violet.

Whenever, therefore, such a source of fallacy can be suspected, the operator would do well to repeat his experiment on white paper, in the manner Dr. Paris has before proposed, and the results which are obtained in glasses should always be examined by day-light, and viewed by reflected, and not by transmitted light.

There are several other tests by which arsenic may be identified. The process described in the Dublin Pharmacopœia for the preparation of *Arsenias Kali*, the arseniat, or rather super-arseniat of potass, which has been long known under the name of "the arsenical salt of Macquer," has been strongly advised as a collateral proof; it consists in decomposing the nitrat of potass by the arsenous acid; but since this problem requires that the suspected poison should be in a solid and palpable form, it is impossible to examine its pretensions to our confidence, without being reminded of the story so often told to us in our infancy, of catching a bird by laying salt upon its tail.

It is necessary to observe in this place, that the *arseniat*, like the *arsenite of potass*, or that of *ammonia*, is obedient to the silver test, but that instead of the yellow precipitate, which is produced

* Some objections have lately been raised to this test, in Silliman's American Journal of Science, vol. iii. p. 354, which require attention.

† This preparation is in fact a solution of the cuprum ammoniatum diluted.

by the latter salt, we obtain by the former a red or brick-coloured one.

In taking an impartial review of all the evidence which the investigation of this subject can furnish, it must appear to the most fastidious, that the silver and copper tests above described, are capable, under proper management, of furnishing striking and infallible indications; and that in most cases, they will be equally conclusive, and in some even more satisfactory in their results, than the metallic reproduction upon which such stress has been laid, and for this obvious reason, that unless the quantity of metal be considerable, its metallic splendour and appearance is often very ambiguous and questionable. It has, to Dr. Paris's knowledge, happened to a medical person, by no means deficient in chemical address, to ascribe to the presence of arsenic that which was no other than a film of very finely divided charcoal: in this state of doubt, the last resource was to ascertain whether it yielded, or not, upon being heated, an alliaceous odour. Surely an unprejudiced judge would prefer the evidence of sight as furnished by the arsenical tests, to that of smell, as afforded in the last experiment. No one will attempt to deny that it is the duty of the medical practitioner who is called upon to decide so important a question as the presence of arsenic, to prosecute by experiment every point which admits the least doubt; he should also remember that in a criminal case, he has not only to satisfy his own conscience, but that he is bound, as far as he is able, to convince the public mind of the accuracy and truth of his researches, and he fails in his duty if he omits, through any false principle of humanity, to express the strong conviction which the success of his experiments must necessarily have produced in his mind. Let it however be remembered, that the application of chemical re-agents on solutions suspected to contain arsenic, throws no obstacle whatever in the way of the metallic reduction of that body, but on the contrary, it furnishes preparatory steps in the process, since the precipitates which are thus produced, may be collected and easily decomposed, as before stated.*

Preparations of Arsenic.

1. *Arsenous acid*, dissolved in distilled water, in the proportion of four grains to a pint. A table spoonful of this solution, mixed with an equal quantity of milk, and a little syrup of poppies, is directed to be taken every morning fasting, and the frequency of the dose gradually increased until six table-spoonsful be taken daily. M. Le Febure's method of curing cancer.
2. *Arsenous acid*, in the solid form, as a pill.

* Chromat of potash has been proposed as a test of the presence of arsenic, by Professor Cooper; and iodine has also been employed for the purpose.

PILULÆ ARSENICI. *A.*

Take of
Arsenous acid, ... two grains;
Opium in powder, . . . eight grains;
Castile soap, ... twenty-two grains.
Form a mass and divide into thirty-two pills.

In the American Dispensatory the same preparation is given, without the addition of the exact quantity of soap here laid down. In fact it is very doubtful whether with the soap, a decomposition may not ensue, and an arsenite of soda be formed. Certainly the amount of soda in the soap, is amply sufficient for the purpose of such a change; and although as a medicine it may be equally efficacious, yet it is not the article we wish to administer; on this account, the conserve of roses or honey, mentioned in the Dispensatory, I think greatly to be preferred: but I would much rather see the prescription altogether abandoned, since it is a work of *some attention and care, so exactly to intermix* the ingredients, that of thirty-two pills, each shall contain an equal amount; which, if they do not, may be attended with unpleasant effects. In short, we scarcely want any other preparation of this metal in medicine, than the

Arsenis Potassæ. *Arsenite of Potash,* or *Fowler's Solution.*

Called in the United States' Pharmacopœia,

Liquor Potassæ Arseniatis. *A.* *Arsenical Solution.*

Take of
Arsenous acid, in fine powder,
Subcarbonat of potass, each . . . sixty-four grains;
Distilled water, ... one pint.
Boil them together in a glass vessel until the arsenic is entirely dissolved. When the solution is cold, pour it into a pint measure, and add thereto
Alcohol, ... four fluid drachms;
and so much distilled water as shall fill up the measure.

With respect to the name here adopted, it is altogether incorrect, and its translation is equally so. The article is not an *arseniat,* or compound of *arsenic* acid and of potash, as *arseniatis* implies, but of *arsenous* acid, or, the white oxyd. The term should have been *Arsenitis;* and certainly, "arsenical solution" equally implies any other solution of this metal or salts, unless the original specific appellation be annexed, which was Fowler's Mineral Solution, or Arsenical Solution. But, as it is not at any rate conformable to the chemical nomenclature of the day, it ought either to have had a correct title in this respect, or to have retained its original one.

It may be objected to the nomenclature in this prescription indeed, that there is a threefold error; for the terms *Arsenical, Ar-*

senious Acid, and *Arsenic*, do really imply three different objects, and all ambiguity should, in matters of such import, be carefully avoided.

The dose of this medicine is from two to fifteen drops, once, twice, or thrice a day; it may be safely augmented by slow degrees. I have administered it even to the extent of eighty drops three times a day.*

With respect to the formula itself, it is to be regretted that the Convention thought it necessary to change the old compound spirit of lavender in it, for alcohol. It is not improved thereby; and the taste and smell, which the lavender was chiefly intended to promote, are now done away; making a solution of perfect transparency, &c. which might be accidentally drank, instead of simple water.

4. The Dublin college have introduced, and still retain the use of "Macquer's Arsenical Salt," or

Arsenias Kali. *D.* *Arseniat of Kali, or Potash.*

Take of
White oxyd of arsenic,
Nitrat of kali, (nitre) of each one ounce.

Reduce them separately to powder; and, after mixing them, introduce them into a glass retort, placed in a sand bath, which is to be gradually heated, until the bottom of the retort becomes obscurely red. It is of advantage to transmit the vapours issuing from the retort, by means of a proper apparatus, through distilled water, and that the nitrous acid extricated by the heat may be condensed. Dissolve the residuum in four pounds of boiling distilled water; and, after due evaporation, set it aside to crystallize.

In this process the nitric acid is partly decomposed, and passes over into the receiver in the state of nitrous acid. The arsenous acid is at the same time converted into arsenic acid, and combines with the potass. The product, which is arseniat of potass, is found in the bottom of the retort, which may be obtained in the form of crystals of a prismatic figure, by dissolving it in distilled water, filtering the solution through paper, evaporating and crystallizing.

5. Arsenic is used, moreover, combined with six times its weight of black pepper, by the native physicians in the East Indies for the cure of the Persian fire (syphilis), and a species of elephantiasis, called juzam. It is also highly recommended in the bites of venemous serpents in large doses of several grains. See Eclectic Repert. vol. iii. p. 324.

6. Arsenous acid, in substance, to the extent of an eighth of a grain for a dose, combined with a little of the flowers of sulphur, has been

* See Med. Museum.

said to be employed internally in some very obstinate cases of cutaneous diseases, and with the best effect.*

ARTEMISIA.

Artemisia Abrotanum. *D. Southernwood. The Leaves.*

This is a perennial shrub, which grows readily in our gardens, though a native of the south of Europe.

Southernwood has a strong smell, which to most people is not disagreeable; it has a pungent, bitter, and somewhat nauseous taste. These qualities are very completely extracted by alcohol, and the tincture is of a beautiful green colour. They are less perfectly extracted by watery liquors, the infusion being of a light brown colour.

Medical use.—Southernwood, as well as other species of the same genus, particularly the absinthium and santonica, has been recommended as an anthelmintic, and it has also been sometimes used as a stimulant, detergent, and sudorific. Externally, it has been employed in discutient and antiseptic fomentations; and under the form of lotion and ointment for cutaneous eruptions, and for preventing the hair from falling off. But it is at present very rarely used in any way.

Artemisia Santonica. *D. E. Wormseed. The Tops and Seeds.*

The Edinburgh and Dublin Colleges have given this species as the plant which produces these seeds, but it is by no means ascertained. They have been ascribed by different writers to other species of the same genus, the Judaica, the Contra, and the Austriaca, and are even said by Saunders to be the produce of a species of Chenopodium.

The seeds themselves are small, oblong, smooth, and of a greenish or greyish yellow colour. As the whole head is gathered after the seeds are ripe, they are mixed with the scales of the calices and bits of stalks. Their taste is bitter, and somewhat acrid; their smell strong and disagreeable. Those which come from Aleppo are esteemed the best, and those from Barbary the worst. When they have no smell, and a less intensely bitter taste, and are discoloured, and mixed with a longer kind of seed, they are to be rejected. They are also adulterated with the seeds of tansy and wormwood. The latter are easily known, by having a light yellow colour, and resembling powdered hay more than seeds. Neumann obtained from 480 parts, 213 of alcoholic extract, and 110 watery, and in-

* Mr. John Marshall's essay, entitled "Remarks on Arsenic, considered as a poison and a medicine," &c. is strongly recommended to the consideration of the reader. Also, Mr. Hill's paper in the Edinburgh Medical Journal.

versely, 260 watery, and 28 alcoholic. It gave a slight flavour to water distilled from it, but no oil.

Medical use.—Wormseed now rejected by the London College, is one of the oldest and most common anthelmintics, especially in the lumbrici of children. On account of their essential oil, they are heating and stimulating.

They are given to children

1. In substance to the extent of ten grains, or half a drachm, finely powdered, and strewed on bread and butter; or made into an electuary with honey or treacle; or candied with sugar; or diffused through milk, and taken in the morning when the stomach is empty.
2. In infusion or decoction, but to these forms their bitterness is a strong objection.

After they have been used for some days, it is customary to give a cathartic, or they are combined from the beginning with rhubarb, jalap, calomel, sulphat of iron, or muriat of ammonia.

Artemisia Absinthium. *E. L. D.*

Common Wormwood, Leaves and Flowering Heads.

This perennial herb grows by the road-sides and on rubbish in many parts of Britain; and about London is cultivated for medical use. Its smell is strong and disagreeable; its taste intensely bitter. Its active constituents are bitter extractive and essential oil. It is used in stomach complaints, and is of great service to hypochondrists. It is also employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and against worms. Many persons cannot suffer the disagreeable smell of wormwood, which is apt to occasion headach, but it may be freed from it in a great measure by decoction. The extract is a pure and simple bitter. The essential oil is of a dark green colour, and contains the whole flavour of the plant. It is stimulating, and is supposed to be a powerful antispasmodic and anthelmintic. It was formerly much used for the preparation of medicated wines and ales.

ARUM AMERICANUM. *Catesb.*

Dracontium Fœtidum. *A. Linn.* Pothos Fœtida. *Michaux.*

Ictodes Fœtidus. *Big.* Symplocarpus Fœtida. *Nuttall.*

Skunk Cabbage. Roots and Seeds.

This plant would seem much more deserving of attention, than some others which have been admitted into our Pharmacopœia. Professors Bigelow and Barton, in their Medical Botany, have given sufficient evidence of its powers to render it worthy of attention.

Dr. Bigelow says "the structure of this singular vegetable has caused it successively to be assigned to the genera *Arum*, *Dracontium*, and *Pothos*, with none of which it fully agrees." Disagreeing likewise in the propriety of the appellation *Symplocarpus*, he had fixed on one, which is a translation, as nearly as possible, of its common English name, *Ictodes*, from ἴκτις, *viverra*, and ὄζω, *oleo*. To this genus only the present plant can be assigned. It belongs to *Tetrandria Monogynia*. For a particular detail of its botanical characters, reference may be had to the works mentioned above.

The odour of the ictodes is said to reside in a very volatile principle. The root contains an acrid principle, which is readily dissipated by heat; a resinous substance, and a gummy or mucous principle are also found in it. The seeds contain abundance of fixed oil.

The sensible properties of the ictodes, have a strong affinity with those of assafœtida and other fœtid gums, and rank it among the antispasmodics. The roots dried and powdered have proved of excellent use in asthmatic cases, and often afforded relief in this distressing disease when other means were ineffectual. It should be exhibited during the paroxysm, and repeated as circumstances may require, in doses of thirty or forty grains. It will be proper to persevere in the use of it for some time after the paroxysm has gone off, or till the patient is perfectly recovered, which is said to have been the method pursued by the Indians for the cure of this disease. The Rev. Dr. Cutler has announced his opinion of its efficacy as experienced in his own particular case after other remedies had disappointed his expectations. The antispasmodic powers of the skunk cabbage root have been displayed when prescribed in other diseases. In one of the most violent hysteric cases I ever met with, says a correspondent, where the usual antispasmodics and even musk had failed, two tea-spoons full of the powdered root in spirits and water produced immediate relief, and on repeating the trials with the same patient, it afforded more lasting benefit than any other medicine. In those spasms frequently affecting the abdominal muscles in parturition, he adds, it produces the desired effect in doses of one tea-spoon full repeated occasionally. In numerous other instances of spasmodic affection, and also in chronic and acute rheumatism, this root either in powder or decoction has evinced its efficacy, and performed important cures. Two instances have been stated, in which this medicine has been supposed to be remarkably efficacious in the case of dropsy; two tea-spoons full of the powdered root being taken every morning successively till the cure was effected. The seeds of this plant are said by some to afford more relief in asthmatic cases than the root. A caution is suggested by Dr. Cutler, that in collecting the roots, the *white hellebore* or *poke root*, which some people call skunk weed, be not mistaken for this plant, as the consequence might be fatal. There is an obvious distinction; the hellebore has a stalk, but the skunk cabbage has none; and the roots of the latter are much larger than those of the former.

ARUM MACULATUM. *D. Wake-robin. The recent Root.*

This is a perennial, solid, bulbous-rooted plant, which grows wild in shady situations, and by the sides of banks, in many parts of Britain. The root is knotty, roundish, and white. When collected in spring before the leaves shoot, or in autumn after flowering, it contains a milky juice of very great acrimony. Applied to the tongue, it causes a burning heat, which last for many hours, and excites considerable thirst. These disagreeable symptoms may be relieved by butter-milk or oily fluids. Rubbed between the fingers, it blisters and excoriates them; it is therefore a corrosive vegetable poison. In the state of dry powder, it is perfectly inert, but the roots may be preserved fresh for a year by burying them in a cellar in sand. It is also rendered perfectly mild by frequent washing with water. Its acrimony is therefore easily destructible; and, as it does not arise from the presence of an essential oil, it depends upon a vegetable principle, different from all others, and not well understood. It does not rise in distillation either with alcohol or with water, and is not contained in its extract, although the root is thereby deprived of it. Neumann obtained from 480 of the dry root 20 of alcoholic extract, and about 180 watery. The former had some slight pungency, and the latter none.

Medical use.—In the recent root, the degree of acrimony is so very uncertain, and often so excessive, that its effects, as an internal remedy, cannot be depended on. The dried root is perfectly inert, so much so, that the French prepare from it the harmless but high-priced cosmetic, called *Cypress powder.;* but the fresh root may be kept in a state fit for medical use, for a year, by burying it in a cellar in sand. It is given in chlorotic cachectic cases, and in a relaxed state of the stomach supposed to arise from an accumulation of phlegm, and in some rheumatic affections, in the dose of ten or fifteen grains, three times a day, in the form of a conserve or bolus.

ARUM. *A. Dragon-root.*

ARUM TRIPHYLLUM. *Indian Turnip. The Root.*

The acrimony of the recent root of this plant is well known. By drying, much of this is lost. It has been very beneficial in asthma, especially in old people; in the croup and hooping cough. The recent root boiled in lard to the consistence of an ointment, has been found useful in tinea capitis; the fresh root boiled in milk has been advantageously employed in consumption. Dr. Mease recommends the following as the best form for exhibiting it: "Grate one dried root, and boil it in half a pint of milk." Some acrimony should be perceptible to the tongue and throat in its exhibition. He says, it never affects the general circulation, but acts solely on the parts just named; to the glands of which it is a powerful stimulus, causing a copious secretion of mucus.

A fine sago has been prepared from the root, in the proportion of one part, to four of the root, freed from its exterior coat.

For the particular details respecting this plant, see Bigelow and Barton's Medical Botany.

ASARUM EUROPÆUM. *E. L. D.*

Asarabacca. The Leaves.

This perennial plant is a native of some places of England, although the dried roots are generally brought from the Levant. It grows in moist and shady situations. It produces only two leaves, which are uniform and very obtuse. The root is fibrous, of a grey brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, hot taste; their smell is strong, and not very disagreeable.

In its analysis, it is said by Neumann to agree with ipecacuanha, but it seems to contain, besides its odorous principle, which is probably camphor, a portion of the same acrid principle which has been noticed when speaking of arum. Upon this its virtues depend; and as this principle is volatile, we find accordingly that asarabacca loses much of its activity by decoction and long keeping.

Medical use.—Given in substance from half a drachm to a drachm, it evacuates powerfully both upwards and downwards. It is said, that tinctures made in spirituous menstrua possess both the emetic and cathartic virtues of the plant: that the extract obtained by inspissating these tinctures acts only by vomiting, and with great mildness: that an infusion in water proves cathartic, rarely emetic: that aqueous decoctions made by long boiling, and the watery extract, have no purgative or emetic quality, but prove good diaphoretics, diuretics, and emmenagogues.

The principal use of this plant is as a sternutatory. The root of asarum is perhaps the strongest of all the vegetable errhines, white hellebore itself not excepted. Snuffed up the nose, in the quantity of a grain or two, it occasions a large evacuation of mucus, and raises a plentiful spitting. The leaves are considerably milder, and may be used to the quantity of three, four, or five grains. Geoffroy relates, that after snuffing up a dose of this errhine at night, he has frequently observed the discharge from the nose to continue for three days together: and that he has known a paralysis of the mouth and tongue cured by one dose. He recommends this medicine in stubborn disorders of the head, proceeding from viscid tenacious matter, in palsies, and in soporific distempers.

ASARUM. *A.* (*Secondary.*)

Canada Snake-root. The Root.

Asarum Canadense. *Wild Ginger, &c.*

Although approaching the preceding species in form, it differs from it in its effects on the human system.

From the agreeable aromatic taste of the root, the names of Wild Ginger and Snake-root, have been given it in different parts of the country. It is also known by that of Colt's Foot.

By analysis, Dr. Bigelow obtained from the root a light coloured, pungent, volatile oil, a resin of a reddish colour and very bitter, fæcula, and a gummy mucus. It is not emetic as usually asserted, even in doses of half a drachm.

It is considered as a substitute for ginger, and it is said to act as a warm stimulant and diaphoretic. Upon the whole, it may well be dispensed with for medical use.

ASCLEPIAS TUBEROSA. *A.* (*Secondary.*)

Butterfly weed. The Root.

Asclepias Decumbens, &c. Pleurisy Root. Flux Root, &c.

Pentandria Digynia.

This is one of our most beautiful perennial plants, flourishing best in a light, sandy soil, by the way side, under fences, and near old stumps in rye fields, &c. It abounds in the southern states. There are sometimes fifteen or twenty, or more stalks, the size of a pipe stem, proceeding from one root, rising from one to two feet in height, and spreading to a considerable extent, generally in a decumbent position. The stalks are round and woolly, of a reddish brown colour on the sun side; the leaves stand irregularly, and are spear, or tongue shaped, with a short foot stalk, and covered with a fine down on the under surface. The umbels are compact at the extremities of the branches, and formed like the common silkweed, but differing from it in the colour of the flowers, being of a beautiful bright orange colour, while those of the silkweed are of a pale purplish hue. The flowers appear in July and August, and are distinguished by their size and brilliancy from all the flowers of the field. These are succeeded by long slender pods, containing the seeds, which have a delicate kind of silk attached to them. This is probably the only variety of asclepias that is destitute of a milky juice. The root is spindle, or carrot shaped, of a light brownish colour on the outer surface, white, coarse and striated within. It has been long celebrated in Virginia and the Carolinas, as a remedy in pleurisy, and in pneumonic affections in general. It is said to display a remarkable power of affecting the skin, inducing general and plentiful perspiration without heating the body. In the form of decoction it often induces a diaphoresis when other medicines have failed to

produce that effect. The powdered root frequently acts as a mild purgative, but it is particularly valuable for its virtues as an expectorant, diaphoretic, and febrifuge, and in this respect its efficacy is amply confirmed by the testimony of Dr. Benjamin Parker, of Bradford, Massachusetts, from his own observation during an extensive practice of twenty-five years. In pneumonic fevers, recent colds, catarrhs and diseases of the breast in general, this remedy has in his hands proved equally efficacious. He directs it to be given in the form of strong infusion, a tea-cup full every two or three hours. By many families in the country this root has long been esteemed as a domestic medicine, and resorted to for the relief of pains of the stomach from flatulence and indigestion, hence the vulgar name of *wind root,* by which it is known in some parts of the country, and from its colour it is by some called white root. As a diaphoretic, Dr. Chapman speaks of it in a manner equally favourable.

Dr. Bigelow has given an engraving of this plant in his medical botany, and very fully detailed all the information possessed respecting it.

ASCLEPIAS SYRIACA. *A.* (*Secondary.*)

Common Silkweed. The Root.

From the abundance of its milky juice, this has also been called *milk-weed.* The leaves are spear or tongue shaped, larger than the preceding, and in August, its aggregate, reddish, or purple blossoms, are exhibited at the extremities of the branches and axillæ of the leaves. The seeds are contained in large oblong pods, and are crowded with down extremely fine and soft, resembling silk, which has occasioned the name of silkweed. This substance has been mixed with cotton and spun into candle-wicks. The stalk of this species is from three to six feet high, the leaves large, standing on short foot stalks. A milky juice exudes from the stems or leaves when broken. The root, as soon as it penetrates the earth, shoots off horizontally, and often sends out other stalks. The large roots are cortical and ligneous. It abounds near fences on the road side in all parts of the country.

Dr. Abijah Richardson, of Medway, Massachusetts, has been induced to try the effects of this species. He gave the cortical part of the root in powder, one drachm in a day, in divided doses, and also in strong infusion. An asthmatic patient was much benefited by its use. In one case of typhus fever, with catarrhal affection of the throat and bronchiæ, it rendered the expectoration more copious, and the matter thicker and more digested. In both cases it had an anodyne effect; the patients were relieved from pain, from dyspnœa and cough, and expectoration became easier and sleep more refreshing.

ASCLEPIAS INCARNATA. *A.* (*Secondary.*)

Flesh coloured Asclepias. The Root.

I know nothing of the virtues of this plant.

The family of asclepias is very abundant, and it is probable they are all possessed of the same properties in different degrees.

ASSAFŒTIDA. *A. Assafœtida. Gum resin.*

FERULA ASSAFŒTIDA. ***E. L. D.***

Pentandria Digynia. Nat. Ord. *Umbellatæ.*

The plant which furnishes assafœtida is perennial and a native of Persia. The gum resin is procured from the roots of plants which are at least four years old. When the leaves begin to decay, the stalk is twisted off, and the earth removed from about their large tapering roots. The top of the root is some time afterwards cut off transversely; and forty-eight hours afterwards, the juice, which has exuded, is scraped off, and a second transverse section is made. This operation is repeated until the root be entirely exhausted of juice. After being scraped off, the juice is exposed to the sun to harden.

It is brought to us in large irregular masses, composed of various little shining lumps or grains, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best which are clear, of a pale reddish colour, and variegated with a number of elegant white tears.

The colour of the tears seems in part, to depend on the action of oxygen; for beautiful white tears broken asunder, will frequently assume, in a short time, on the fresh surface, the reddish tint. It is doubtless, when first exuding from the plant, altogether white.

This drug has a strong fetid smell, somewhat like that of garlic; and a bitter, acrid, biting taste. It loses some of its smell and strength by keeping: a circumstance to be particularly regarded in its exhibition.

Chemical Composition.—Gum (or, according to Brugnatelli, *extractive*) 60, resin 30, essential oil 10 parts. From four ounces Tromsdorff got thirty-three grains of volatile oil, lighter than water, twenty of heavy oil, seven drachms twelve grains of bright brown resin, and two ounces four drachms of brown bitter extract, of a nauseous, slightly alliaceous taste, which rises in distillation both with alcohol and water.

Solubility.—All its virtues yielded to alcohol and ether. By trituration with water it forms a milky but not permanent mixture, unless by the aid of some intermedium, as the *yolk* of an egg to a drachm of the assafœtida. A permanent mixture is made by carefully triturating it with a double weight of mucilage. Half a drachm

of camphor, triturated with six drachms of the assafœtida, forms a mass fit for plasters; and if rubbed with carbonat of ammonia, it is readily pulverized without any other change.

Medical use.—It is the most powerful of all the fetid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodic, expectorant, emmenagogue and anthelmintic. Its action is quick and penetrating.

It is often serviceable,

1. In croup, and whooping cough.
2. In dyspepsia, amenorrhœa and chlorosis.
3. In asthma, dyspnœa and hysteria.
4. In tympanites and worms.

It is exhibited,

1. In substance, in the form of pills; in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives.
2. Dissolved in some simple distilled water.
3. Dissolved in alcohol.
4. In the form of clyster, to the extent of about two drachms.

The goodness of this article is judged of by the strength of its characteristic odour. When broken it ought to exhibit a bluish red appearance, and it ought not to be brittle.

AURUM. *A.—GOLD.*

Gold is of a brilliant yellow colour, insipid, and inodorous; specific gravity between 19.258 and 19.300; soft and flexible; little elasticity or sonorousness; so ductile, that its surface may be extended more than 650,000 times; of very great tenacity; easily hammer-hardened; a good conductor of caloric, electricity, and galvanism; fusing at 32° of Wedgwood; brittle when cooled too quickly; crystallizing in octohedrons; unalterable in the air; converted by a long and violent heat into a vitrified violet oxyd; oxydized and dispersed by electricity; soluble in alkaline sulphurets; rendered brittle by phosphorus, arsenic, bismuth, tin, and antimony; less brittle by lead; soluble in mercury; hardened by zinc, copper, iron, steel, and silver; oxydizable, of a purple colour, and slightly soluble in nitrous acid; readily oxydized and dissolved by nitro-muriatic acid. Its oxyd is easily reduced by light and heat, colours glasses purple or topaz yellow, and forms a fulminating compound with ammonia.

AURI MURIAS. *A.* *Muriat of Gold!*

Take of

Pure gold, any quantity.

Dissolve it by means of a moderate heat, in a mixture formed by uniting one part of nitric acid with two parts of muriatic acid; evaporate the solution to dryness by a gentle heat; add to the residuum an equal weight of *muriat of soda,* and mix them thoroughly together. Dissolve the mixture in distilled water, and evaporate slowly to dryness. Collect the mass and keep it in a glass-stopped phial, which should be accurately closed, and preserved from the action of light.

It will be very difficult I believe to persuade chemists that the above preparation is a *muriat of gold* simply considered, as the name imports. Dr. Chrestien, who proposes such a preparation, speaks of it as a muriat with two bases. It is a soda-muriat of gold, and as a triple salt should receive its denomination.

This metal was formerly supposed to possess medicinal properties, but its preparations were expunged from modern pharmacopœias as being considered unfriendly to the human constitution, or devoid of efficacy as a remedy in disease.

In a publication printed at Paris in 1811, by Dr. J. A. Chrestien of Montpelier, the medical faculty are again invited to investigate the properties of gold. The author proposes a preparation of this metal as a new remedy for the treatment of venereal and lymphatic disorders. His numerous experiments on the anti-syphilitic powers of the preparations of gold, have greatly elated his hopes, and rendered him so sanguine as to affirm, that their efficacy is equal if not superior to that of mercury; that they are capable of effecting a radical cure of the varied forms of this disease, without producing salivation, or any derangement of the functions of the body, and that no season, nor temperament, and no complication of the disease can create any obstacle to their efficacy.

Of the above assertion we are not left destitute of corroborative evidence.

Doctors Seaman and Pascalis of New-York have experienced the anti-syphilitic virtues of the preparations of this metal, and their observations, so far as they have extended, are in confirmation of the opinion of Dr. Chrestien.

Gold may be employed, for this purpose, in the state—1. Of minute division. 2. Of oxyd. 3. Of oxyd in combination with ammonia. 4. Of oxyd in combination with oxyd of tin. 5. Of muriat.

The first of these, denominated by the author, "*Or devise,*" was prepared by forming an amalgam of gold and quicksilver, and afterwards withdrawing the latter by exposing the compound to the rays of the sun concentrated by a convex lens, to the heat of a fire, or to the action of nitric acid. The gold remained in the form of an impalpable powder.

The yellow oxyd of gold was obtained by precipitating it from its solution in nitro-muriatic acid by potash. The manner of effecting this he has not mentioned, and, as it will be seen below, there are some difficulties in the way of preparing it of an uniform strength. The oxyd precipitated from its solution by ammonia, was soon laid aside from the danger of its spontaneous explosion.

The compound oxyd of gold and tin, may be obtained by mixing the solutions of these metals, or by adding metallic tin in filings to a diluted solution of gold. He prefers the latter.

The muriat of gold, says Dr. Chrestien, procured by evaporating the solution to dryness, was so deliquescent, and caustic, that I made but little use of it; but supposing a muriat *with two bases* might obviate these inconveniences, I combined the muriat of soda with the solution of gold, and obtained the desired product.

Numerous detailed cases are given in the subsequent part of his work on the effects of each of these preparations, in syphilis. They differ much from each other in activity, the oxyds producing more speedy effects than the powdered gold, and the muriat more powerful action than the oxyds. They were all administered by friction on the tongue, cheeks, or gums. The *or devise* was thus prescribed to the extent of three grains in a day; the oxyd precipitated by potash in a dose of half a grain gradually augmented to two grains; the compound oxyd of tin and gold in rather smaller doses; and lastly, the soda-muriat of gold in the quantity of from one-fifteenth to one-tenth of a grain. On account of the superior activity of the latter, he found it necessary to mix it with certain substances which were capable of diminishing its energy, without abstracting its oxygen. He employed for this purpose *starch, charcoal,* and *painter's lac.*

From the variety of cases brought forward by the author, to prove the activity, and the anti-syphilitic virtues of gold, it appears that within a moderate time it cures chancres, warts, secondary ulcers, sore throats, and other forms of inveterate lues. This favourite remedy of Dr. Chrestien is said also to have effected important cures in cases of diseases of the uterus, of goitre, and other lymphatic diseases or obstructions.

Gold, in a state of minute division, may be procured with facility, by pouring into a diluted solution of this metal a solution of green sulphat of iron; a brown or bluish brown powder will be precipitated, which is metallic gold minutely divided. The best proportions of the acids to dissolve this metal, according to Vauquelin, are, two parts of muriatic to one of nitric acid. Potash and soda, and their carbonats, do not decompose the solution at common temperatures; they merely give it a deep red colour with a little turbidness. The red substance when dried has the appearance of dried blood. It has a styptic metallic taste, and is slightly soluble in water. It is inferred to be a compound of oxyd of gold with a minute portion of muriat of gold.

To precipitate the greatest quantity of oxyd from its solution, by means of the alkalies, we must manage so that no useless acid shall remain in the solution, in order that less of the triple salt may be

formed; this is effected by evaporation to dryness, very cautiously conducted, the product being again dissolved in distilled water.

The circumstance that not one of the British Colleges has given a place to gold or its preparations, impels me to believe, that the convention have been too precipitate in admitting it into the National Pharmacopœia. It has assuredly not sufficient evidence in its behalf, in this country, to place it in the rank of a *standard* article. Indeed it was long ago reported, that the cases said to be cured at New-York, were obliged to return to the hospital, in consequence of a recurrence of syphilitic symptoms.

AVENÆ FARINA. *A.* *Oat-meal.*

Avena Sativa. *E.* *Oats.* *The husked Seed. Groats, and the Meal.*

This is a well-known annual plant, which is very generally cultivated in northern countries, and in many places furnishes the principal subsistence. When simply freed from the husks, this grain gets the name of *groats*, but it is more frequently ground into meal. Groats are made into broths. Oat-meal is baked with salt and water into cakes, or with the same additions, is boiled to form porridge. An infusion of the husks in water, allowed to remain till it becomes acidulous, is boiled down to a jelly, which is called sowins. In all these forms it is nutritious, and easy of digestion.

Medical use.—Gruels or decoctions, either of groats or oat-meal, either plain or acidified, or sweetened, form an excellent drink in febrile diseases, diarrhœa, dysentery, &c. and from their demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and ulcerations of the fauces. Porridge is also frequently applied to phlegmonous swellings, to promote their suppuration.

AZEDARACH. *A.* *(Secondary.)*

Melia Azedarach. *The Bark.*

Poison Berry Tree. Pride of India or China.

This is not a native of America, but is now completely naturalized to the States of Carolina and Georgia; where it is highly valued for the beauty of its foliage, and agreeable shade, which it affords during the sultry season. In the city of Savannah the streets and public walks were ornamented by rows of this charming tree, but they have lately been demolished. The azedarach has also obtained considerable repute for the medicinal virtues which it is found to possess. The late Professor Barton says it is one

of the most valuable anthelmintics that has hitherto been discovered, and many respectable physicians in Savannah repose the fullest confidence in its efficacy. To Dr. L. Kollock, vice-president of the Georgia Medical Society, we are indebted for the following information. "It is a vermifuge of efficacy. Its use is in some measure general among the planters; and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces of the bark of the fresh root, is boiled in a quart of water, till it acquire the colour of strong coffee, i. e. to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operates. Given in this manner, its operation is powerful, sometimes both vomiting and purging. The strength of the decoction is however varied according to the intention." The dried berries of this tree have been advantageously employed as an anthelmintic, in Carolina; children being allowed to eat them at pleasure. The pulp of the fruit formed into an ointment with lard, it is said, has been successfully employed in tinea capitis.

B.

BALSAMUM.—*BALSAM.*

Several articles employed in medicine, are known under the name of balsams. It has been agreed on, to consider those only as such, which contain benzoic acid. Yet copaiba, altogether deficient in it, still retains the name. In all of their principal properties, balsams resemble the resins, which will hereafter be noticed.

COPAIBA. *A. L.* Balsamum Copaibæ. *D.*
Resina Copaiferæ Officinalis. *E.*
Copaiba, Copaiva, or Capivi Balsam.

The Copaifera officinalis which produces this resin, is a native of the Spanish West-Indies, and some parts of South America. It

grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk.

The juice is clear and transparent, of a whitish or pale yellowish colour, and agreeable smell, and a bitterish pungent taste. It is usually about the consistence of oil, or a little thicker; when long kept, it becomes nearly as thick as honey, retaining its clearness, but has not been observed to grow dry or solid, as most of the other resinous juices do. The best resin of copaiva comes from Brazil; but we sometimes meet with a thick sort which is not at all transparent, or much less so than the foregoing, and generally has a portion of turbid watery liquor at the bottom. This is probably either adulterated by the mixture of other substances, or has been extracted by decoction from the bark and branches of the tree: its smell and taste are much less pleasant than those of the genuine resin.

Pure resin of copaiva dissolves entirely in alcohol: the solution has a very fragrant smell. Distilled with water it yields a large quantity of a limpid essential oil, but no benzoic acid: it is therefore not a balsam, but a combination of resin and essential oil. Neumann says that it effervesces with liquid ammonia.

Medical use.—The resin of copaiva is an useful corroborating detergent medicine, but in some degree irritating. It strengthens the nervous system, tends to loosen the belly; in large doses proves purgative, promotes urine, and cleans and heals exulcerations in the urinary passages, which it is supposed to perform more effectually than any of the other resinous fluids. Fuller observes, that it gives the urine an intensely bitter taste, but not a violet smell as the turpentines do.

This resin has been principally celebrated in gleets and the fluor albus, and externally as a vulnerary.

The dose of this medicine rarely exceeds twenty or thirty drops, though some authors direct sixty or upwards. In this country it is said to have been given in doses of half an ounce and more, with great advantage in gonorrhœa. It may be conveniently taken in the form of an eleo-saccharum, or in that of an emulsion, into which it may be reduced, by triturating it with almonds, with a thick mucilage of gum arabic, or with the yolk of eggs, till they are well incorporated, and then gradually adding a proper quantity of water.

Adulterations.—It is asserted, that much of that sold in London, is entirely *factitious;* and we are told a curious trial took place some time since, between the owner of certain premises that were burnt down, and the Sun Fire Office, which refused to indemnify the proprietor for his loss, because the fire had been occasioned by his *making* balsam of copaiba. This article is also adulterated with mastiche and oil. Mr. Bucholz asserts, that if it does not dissolve in a mixture of four parts of pure alcohol and one of rectified ether, its adulteration may be inferred. *Rape oil* is also frequently mixed with it, in which case, if dropped into water, the drops *will not retain* their spherical form, as they invariably will, if pure.

Balsamum Peruvianum. *L. D.*

Balsamum Myroxyli Peruiferi. *E. Peruvian Balsam.*

The tree affording this balsam is the *myroxylon peruiferum*, and it grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice, even the leaves are full of transparent resinous points like those of the orange tree.

This balsam as brought to us, is commonly of the consistence of thin honey, of a reddish brown colour, inclining to black, an agreeable aromatic smell, and a very hot biting taste.

It is very often adulterated, and sometimes what is sold for Peruvian balsam, is a spurious mixture of resin and essential oil, flavoured with benzoin. These frauds are not easily detected, and fortunately they are of little importance.

It is said to be obtained by boiling the cuttings of the twigs in water, and skimming off with a spoon the balsam which swims on the top.

By incision this tree yields a much more fragrant white or colourless balsam, which, when inspissated by the heat of the sun, forms, the red or dry balsam of Peru; but it is very rarely to be met with in our shops.

Peruvian balsam consists of a volatile oil, resin, and benzoic acid. It is accordingly entirely soluble in alcohol, and in essential oils. Water dissolves part of the benzoic acid, and fixed oil combines with the resin. It may be suspended in water by trituration with mucilage and yolk of eggs.

Medical use.—Balsam of Peru is a very warm aromatic medicine, considerably hotter and more acrid than Copaiva. Its principal effects are, to warm the habit, and to strengthen the nervous system. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from a debility of the solids. It is also employed externally, for cleansing and healing wounds and ulcers, and sometimes against palsies and rheumatic pains.

It may be given diffused in water, by means of mucilage, or made into pills with any proper vegetable powder. Its dose is from five to fifty drops.

TOLUTANUM. *A.*

Balsamum Tolutanum. *L. D.* Balsamum Toluiferæ Balsami. *E.*

Balsam of Tolu. Tolu.

The Toluifera Balsamum grows in Spanish America, and the balsam flows from incisions made in its bark, during the hot season, and is brought to us in gourd shells. It is of a yellowish-brown colour, inclining to red: in consistence thick and tenacious: by age

it grows hard and brittle, without suffering any great loss of its more valuable parts. The smell of this balsam is extremely fragrant, somewhat resembling that of lemons; its taste warm and sweetish. Lewis says that he has sometimes procured benzoic acid from it; it yields very little volatile oil, although it impregnates the distilled water strongly with its flavour. By dissolving a proper quantity of sugar in this water, a syrup is obtained greatly superior to that prepared in the common way, with a decoction of the balsam.

In its medical virtues it agrees with the other balsams; but it is rarely employed except for its agreeable flavour: yet some practitioners are extravagant in its praises. It is probable the Materia Medica would suffer but little, if the whole catalogue of *balsams* was altogether omitted.

BARYTES.

This substance, considered at one period as an earth, then classed by Fourcroy among the alkalies, seems at length to have found a resting place. The discovery of its metallic nature, has ranked it now with chemists, as an oxyd; although in common acceptation, it still is called an earth.

The metallic base (Barium) is a dark grey-coloured solid; lustre less than cast-iron, heavier than sulphuric acid, decomposes water, and is oxygenized by exposure to the air. The result of this oxygenizement, however effected, is the *oxyd of barium*, or barytes. It is obtained in small, grey, porous masses, of a tolerable solidity; its taste is acrid, urinous, and pungent; applied to the skin, it proves caustic, and it is deleterious when swallowed; its specific gravity is 4.; it is soluble in twenty times its weight of cold water, and in twice its weight of boiling water; depositing, on cooling, transparent, white, prismatic crystals; when slaked, it boils up with violence, becomes very hot, increases in bulk, and is changed into a spongy white mass. It changes vegetable blues to green: it is fusible; it combines with all the acids, sulphur, sulphureted hydrogen, and phosphorus. It possesses the alkaline properties in a high degree.

Barytes is found in nature, in combination with carbonic or sulphuric acids.

Carbonas Barytæ. *E.*

Carbonat of Barytes. Witherite.

This is rather a rare mineral. It was first discovered by Dr. Withering, hence the name of Witherite given to it by Werner. Its co-

lour is greyish-white, sometimes inclining to milk-white, and sometimes with a slight tinge of yellow from a mixture of iron, seldom greenish, often invested with a red ochry crust. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded or affecting that form, seldom crystallized. Texture, fibrous; fracture, conchoidal; fragments, long splinters; specific gravity, 4.3 to 4.338. Although it has no sensible taste, it is poisonous. In medicine it is only used for preparing the muriat of baryta. It is found at Anglesark, in Lancashire, at Alstoon-moor, in Cumberland, in Scotland, and in Sweden.

It is employed by the Edinburgh College to form the MURIAT, according to the following formula.

Take of
Carbonat of barytes,
Muriatic acid, of each, . . . one part;
Water, ... three parts.

Add the carbonat, broken into little bits, to the water and acid, previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and set it aside to crystallize. Repeat the evaporation as long as any crystals are formed.

The scarcity of the carbonat has, however, more generally led to the use of the other variety, the sulphat.

BARYTÆ SULPHAS. *A. E.*

Sulphat of Barytes. Ponderous Earth, &c. &c.

This salt is found abundantly in every country. Many varieties of it exist, both crystallized and amorphous. The *foliated* is generally the purest. It is insoluble in water, and its specific gravity from 4.4 to 4.865. It decrepitates when suddenly heated. By being formed into a thin cake with flour and water, and then heated to redness, it becomes phosphorescent. Heated to redness with charcoal, it is converted into a sulphuret; and it may be decomposed by the carbonats of potash and of soda.

When the carbonat cannot be procured, the sulphat is employed to prepare the muriat, as follows:

BARYTÆ MURIAS. *A. E. Muriat of Barytes.*

Take of
Sulphat of baryta, ... two pounds;
Charcoal in powder, . . . four ounces.

Roast the sulphat, that it may be more easily reduced to a very fine powder, with which the powdered charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire for six hours. Then triturate

the matter well, and throw it into six pints of water in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the action of the air.

Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor. On the undissolved part pour four pints more of boiling water, which, after agitation, and deposition, are to be added to the former liquor. Into the liquor, when still warm, or if it shall have cooled, again heated, drop muriatic acid as long as it excites any effervescence; then strain it, and evaporate it so as to crystallize.

The theory of the above process is as follows:

The acid of the sulphat of barytes is decomposed at a very high temperature by charcoal. At such a temperature charcoal has a greater affinity for oxygen than sulphur has; it therefore decomposes sulphuric acid, by depriving it of its oxygen, and flies off in the state of carbonic oxyd or acid gas, while the sulphur combines with the baryta. On adding water to the sulphuret thus formed, new combinations take place. A portion of sulphat of baryta is regenerated, while hydrogureted sulphuret, and sulphureted hydroguret of baryta remain in solution. This solution is exceedingly prone to decomposition, and must therefore be preserved from the action of the air as much as possible. It also crystallizes by cooling, and therefore should be kept at a boiling heat. On the addition of muriatic acid, there is a violent effervescence and disengagement of sulphureted hydrogen gas, which must be avoided as much as possible, by performing the operation under a chimney, while very pure muriat of baryta remains in solution. When prepared in this way, it cannot be contaminated with any of the noxious metals, as their compounds with sulphur and hydrogen are not soluble. On this account, therefore, it is the process adopted by the Edinburgh College.

The decomposition of the sulphat is sometimes effected by compound affinity, through the means of carbonat of potash, or muriat of lime.

1. With carbonat of potash, either in the dry or humid way.

Klaproth boils sixteen ounces of finely powdered sulphat of baryta with thirty-two ounces of purified carbonat of potass, and five pounds of water, for an hour in a tin kettle, constantly agitating the mixture, and renewing the water as it evaporates. He then allows it to settle, pours off the fluid, which is a solution of sulphat of potass, and edulcorates the precipitate with plenty of water. He next dissolves the carbonat of baryta, which it contains, in muriatic acid. The portion of sulphat which is not decomposed, may be treated again in the same manner.

On the other hand, Van Mons mixes equal parts of sulphat of baryta and carbonat of potass with one-fourth of their weight of charcoal all in powder, and heats the mixture to redness in a crucible. When it cools he washes out the sulphat and sulphuret of potass with water, then boils the residuum with a little potass, and washes

it again. The carbonat of baryta thus obtained, he dissolves in muriatic acid.

But by these methods of decomposing the sulphat of baryta, we do not get rid of the metallic substances which it often contains, and which often render the muriat thus prepared unfit for medical use. But the metalline muriats may be expelled, according to Westrumb, by heating the salt to redness as long as any fumes arise. The pure muriat of baryta is then to be dissolved in water and crystallized. Göttling, with the same intention of getting rid of metallic substances, chooses sulphat of baryta, perfectly colourless, and treats it with muriatic or nitro-muriatic acid before he proceeds to decompose it.

2. La Grange has proposed a new method of decomposing the sulphat of baryta, by means of muriat of lime, which he prepares from the residuum of the decomposition of muriat of ammonia by lime,* by dissolving it in a small quantity of hot water, and evaporating it to dryness. He mixes equal parts of this muriat with sulphat of baryta in powder, and projects it by spoonfuls into a crucible previously heated to redness. When it is all in complete fusion, he pours it out upon a polished stone previously heated. The matter, which cracks as it cools, has a whitish-grey colour, is very hard, sonorous, and deliquescent, is now to be boiled in about six times its weight of distilled water, its solution filtered, and the residuum boiled in a smaller quantity of water. The mixed solutions are then evaporated to a pellicle, and on cooling, furnish beautiful crystals of muriat of baryta, which are to be washed with cold water, and purified by a second solution and crystallization. The mother water of the first crystallization still contains muriat of baryta, which may be separated from the muriat of lime, with which it is mixed, by repeated solutions and crystallizations. La Grange thinks that this process not only saves time, fuel, and muriatic acid, but that it furnishes a purer muriat of baryta.

With respect to the muriat of barytes, it commonly crystallizes in tables. It has a disagreeable bitter taste; is soluble in five parts of water at 60°, and in less boiling water. It is scarcely soluble in alcohol; and its solution burns with a yellow flame. It crystallizes by evaporation: its crystals are permanent; and by the action of heat decrepitate, dry, and melt. When crystallized, it contains 20 acid, 64 baryta, and 16 water; when dried, 23.8 acid, and 76.2 baryta. It is decomposed by the sulphats, nitrats, and sulphites; and by the alkaline phosphats, borats, and carbonats. It is also decomposed by succinat of ammonia, nitrat of silver, acetat, nitrat and phosphat of mercury, acetat of lead, tartrats of iron and antimony, burnt sponge, and Hermbstadt's antimonial tincture, antimonial wine, soap, &c.; extracts of gentian, marsh trefoil, and the inspissated juices of aconite, hemlock, and hyoscyamus.

It is not decomposed by muriat of iron, or corrosive sublimate,

* An excellent mode of obtaining the muriat of lime, as large quantities of this salt in solution may be readily procured from those who prepare ammonia.

and bears the addition of aromatic distilled waters, simple syrups, gum arabic mucilage, some simple extracts, pure opium, and similar substances, when they do not contain astringent matter. When pure it has no colour; does not deliquesce; does not burn with a red or purple flame, when dissolved in alcohol; and is not precipitated by gallic acid, prussiat of potass and iron, or hydro-sulphuret of ammonia. By washing with alcohol muriat of baryta, rendered impure by the presence of muriat of iron, the latter alone is dissolved.

It is commonly given in solution.

LIQUOR BARYTÆ MURIATIS. *A.*

Solutio Muriatis Barytæ. *E.*

Solution of Muriat of Barytes. Terra Ponderosa Salita, &c.

Take of
Muriat of baryta, ... one ounce;
Distilled water, ... three fluid ounces.
Dissolve.

In making the solution, the crystals should be used entire; for when previously powdered, it always turns out turbid.

The proportion of water directed here for the solution of muriat of baryta, is considerably less than what is stated to be necessary by the writers on chemistry. It is however sufficient, even at the lowest ordinary temperatures; a circumstance which should be attended to in making saturated solutions of saline bodies.

Medical use.—Muriat of baryta is generally said by writers on the Materia Medica to be a *stimulant* deobstruent; and yet Hufeland, one of its greatest supporters, says, that it succeeds better in cases attended with inflammation and increased irritability than with atony and torpor. When given in large doses, it certainly produces nausea, vomiting, diarrhœa, vertigo, and death. Barytes is very poisonous, not only in its pure state, but likewise in its saline combinations. It is indeed asserted, that the sulphat is not so; and this arises probably from its great insolubility. If then, by accident or design, dangerous symptoms occur from its exhibition, the best mode of obviating them, would be, to give diluted sulphuric acid, or any of the sulphats, as Glauber's salt, by which the insoluble sulphat would be formed, and by purgatives may be removed from the stomach or intestines.

Its effects on a morbid state of the body are also disputed. Some assert that it is of advantage in no disease; while others bestow upon it the most unqualified praises. By the latter it is principally celebrated,

1. In all cases of scrofula.
2. In obstructions and tumours.
3. In cases of worms.
4. In cutaneous diseases.

The dose of the solution at first, is five or ten drops twice or thrice a-day, to be gradually and cautiously increased to as much as the patient can bear.

The solution is also used externally as a stimulating and gently-escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

It is a question of some curiosity, why the remedies which have been recommended for the cure of scrofula, should have been chiefly chosen from among the *muriatic salts*, such as the muriats of mercury, barytes, lime, &c. The only *constant* ingredient in all these, is evidently muriatic acid, agreeably to the old doctrine, or chlorine, conformably to the new. It may be well to ascertain, therefore, the merits of chlorine itself, in its simple state of solution in water.

BELLADONNA. *A.*

Atropa Belladonna. *E. L. D. Deadly Nightshade. The Leaves.*

The deadly nightshade is a perennial plant, with an herbaceous stem, which is indigenous both in mountainous and woody situations in Great Britain, and is often cultivated in gardens. The whole plant is poisonous, and the berries, from their beautiful appearance, have sometimes proved fatal to children. The symptoms excited are, a dryness of the mouth; a trembling of the tongue; a very distressing thirst; a difficulty of swallowing; fruitless efforts to vomit; and great anxiety about the præcordia. Delirium then comes on, with gnashing of the teeth and convulsions. The pupil remains dilated, and is not sensible even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked. Inflammation attacks the œsophagus, stomach, and intestines, sometimes extending to the mesentery, lungs, and liver, accompanied with violent pains in the abdomen. The stomach is very insensible to stimulus, and the peristaltic motion of the intestines is destroyed. General relaxation, palsy, especially of the lower extremities, convulsions, vertigo, blindness, coma, and death, succeed. The body soon putrefies, swells, and becomes marked with livid spots; blood flows from the nose, mouth and ears, and the stench is insufferable. On dissection, the blood is found to be fluid, the intestines are inflated and inflamed, or eroded and gangrenous. The best method of cure is to excite vomiting as soon as possible, by emetics and tickling the fauces; to evacuate the bowels by purgatives and clysters; and to give largely, vinegar, honey, milk, and oil. In some children who recovered by this treatment, the delirium was succeeded by profound sopor, accompanied with subsultus tendinum; the face and hands became pale and cold, and the pulse small, hard, and quick. The recovery was slow, and the blindness continued a considerable time, but at last went off.

By distillation in the vapour bath, Geoffroy procured from the recent leaves a slightly acrid liquor, and the residuum, by destructive distillation, yielded a suitable quantity of carbonat of ammonia.

Medical use.—Yet this virulent poison, under proper management, may become an excellent remedy. Besides a very remarkable narcotic power, it possesses considerable influence in promoting all the excretions, particularly by sweat, urine, and it is also said by saliva; but its exhibition requires the greatest caution; for it is apt, when continued for any length of time, even in small doses, to cause dryness and tension of the throat and neighbouring parts, vertigo, dimness of sight, and even temporary blindness. When any of these symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly nightshade has been exhibited,

1. In several febrile diseases; in obstinate intermittents; and in the plague.
2. In inflammations; the gout.
3. In comatose diseases; in palsy and loss of speech from apoplexy.
4. In spasmodic diseases; in chorea; epilepsy; chincough; hydrophobia; melancholy, and mania.
5. In cachectic affections; in dropsies and obstinate jaundice.
6. In local diseases; in amaurosis; in ophthalmia; in scirrhus and cancer.

Deadly nightshade is best exhibited in substance, beginning with a very small dose of the powdered leaves or root, such as the fourth or eighth part of a grain for children, and one grain for adults, to be repeated daily, and gradually increased. In hydrophobia, Münch gave the powdered root every second morning, to the extent of from one to five grains to children, and fourteen or fifteen grains to adults.

The watery infusion is also a powerful remedy. One scruple of the dried leaves are infused in ten ounces of warm water, and strained after cooling. At first, two ounces of this may be given daily to adults, and gradually increased, until the tension of the throat shows that it would be imprudent to go farther.

The watery extract is not a judicious preparation.

Externally, the powdered leaves are applied as a narcotic to diminish pain, and to cancerous and ill-conditioned sores. From its effect in permanently dilating the pupil, Professor Reimarus proposed, and tried with success, the dropping a little of the infusion into the eye, a few hours before performing the operation for the cataract, with the view of facilitating the operation.

To what has been said, it may be added, that Vauquelin found the leaves to contain a substance analogous to albumen; salts, with a base of potash, and a bitter principle on which its narcotic properties depended; and more lately the presence of an alkaline element has been detected, which has received the name of *Atropia*, the sulphat of which crystallizes beautifully.

The power of Belladonna to dilate the pupil is mentioned by Ray, in his Histor. Plant. 1686, vol. i. p. 680, in a case of cancer below the eye to which it was applied. "Quæ noctis unius spatio, uveam oculi tunicam adeo relaxavit, ut omnem explicandi sese, et pupillam contrahendi facultatem ei adimeret," and this continued dilated, even in the strongest light, more than four times larger than the opposite. The same result ensued three different times.

BENZOINUM. *A. L.*

Benzoe. *D.* Balsamum Styracis Benzoini. *E.*

Benzoin. A Balsam.

This species of styrax grows in Sumatra, and furnishes a balsam on being wounded. It is brought from the East Indies only; in large masses composed of white and light brown pieces, or yellowish specks, breaking very easily betwixt the hands; such as is whitish, and free from impurities, is most esteemed.

In its properties it differs from storax, only in containing a larger proportion of benzoic acid. Neumann found that it was totally soluble in alcohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. By sublimation he got two ounces of impure acid from sixteen of benzoin. Lime and the alkaline carbonats dissolve the acid without attacking the resin, and are accordingly employed in the processes of Scheele, Göttling, and Gren, for obtaining the benzoic acid. Dr. Duncan found that the solution of potass dissolves benzoin very rapidly, forming a dark coloured solution, mixed with fine crystals of benzoat of potass. This alkaline solution is not decomposed by water, but forms with acids a rose-coloured coagulum, easily soluble in excess of acid. Boiling nitrous acid also attacks benzoin with great violence, the solution becomes turbid and lets fall a copious precipitate on cooling, which, according to Mr. Brande, is benzoic acid. It is also decomposed by water, and by alkaline solutions.

ACIDUM BENZOICUM. *A. L. E. D.*

Benzoic Acid. Flowers of Benzoin.

Take of

Benzoin, any quantity.

Liquefy it in a wide-necked retort, having a receiver fitted to it, but not luted, and sublime with a gentle heat. Remove the sublimed matter occasionally from the tube of the retort, lest it accumulate in too great quantity. If it be soiled with oil, wrap it between folds of blotting paper, then press it strongly, and repeat the sublimation.

Benzoic acid crystallizes in compressed prisms of a pungent taste and aromatic smell. It is fusible, and evaporates by heat, for the most part, without change. When brought in contact with flame, it catches fire, and leaves no residuum. It is permanent in the air. It is very sparingly soluble in cold water; but at 212° it dissolves in about twenty-four waters. It is also soluble in hot acetic acid. It is soluble, without change, in alcohol, in concentrated sulphuric and nitric acid, and is separated from them by water.

Benzoats are little known, but generally form feather-shaped crystals, and are soluble in water.

The distinguishing character of balsams is their containing benzoic acid, which may be separated from the resin, their other principal constituent, either by simple solution in water, sublimation, or by combining it with a salifiable base. The Dublin College directs it to be done in the second way, But, even with the greatest care, it is almost impossible to manage the heat so as not to decompose part of the resin, and thus give rise to the formation of an empyreumatic oil, which contaminates the product. Nor can it be freed completely from the empyreumatic oil by bibulous paper.

The other method of separating benzoic acid from resin, was first practised by Scheele, who employed lime water; Göttling afterwards used carbonat of potass; and, lastly, Gren used carbonat of soda, which has been adopted by the Berlin College, and now by that of Edinburgh. Mr. Brande, and he has been followed by the London College, prefers Scheele's process, as the lime dissolves less of the resin of the benzoin than the alkalies do. In experiments which he made for the purpose of ascertaining the comparative value of the different processes, he obtained from one pound of benzoin,

	Grains.
By sublimation, ...	960.
— Scheele's process, ...	899.
— Gren's and Göttling's process, . . .	810.
— by boiling benzoin in water, ...	590.

As the crystallized acid, on account of its lightness and elasticity, is not easily reduced to powder, for most purposes it will be more convenient to keep it in a state of precipitate.

It may also be extracted from storax, and all the other balsams, particularly those of Tolu or Peru; and from the urine of children, and of herbivorous animals.

The benzoic acid has an agreeable taste and a fragrant smell, especially when heated. It is soluble in alcohol, and in boiling water, but very sparingly in cold water, although it may be suspended in it by means of sugar, so as to form an elegant balsamic syrup.

BISMUTHUM. *A.—BISMUTH.*

This metal is white, slightly yellow, in large specular plates; pulverizable: specific gravity 9.822; moderately hard; sensible odour and taste; fusible at 460°, and volatile at a high temperature; oxydizable by heat and air; oxyd vitrifiable into a greenish yellow glass; oxydizable by boiling sulphuric, nitric, and muriatic acids; unites with sulphur. Oxyd yellow, and colours glass of a greenish yellow. Our National Pharmacopœia has *reinstated* this metal in the lists of the Materia Medica. It has been so long forgotten, as to have been lately introduced into practice as a new remedy. It will, however, be found so far back at least as 1676, in *Salmon's* Pharmacopœia Londinensis, under the title of *Crude Marcasite*, or *Bismuth*; as well as the *Magisterium Marcasitæ*, or Magistery of Bismuth. The only difference in its preparation from that presently to be noticed, is in the nitrat being precipitated with *cold sea, or salt water*.

It does not seem to have been much, if at all, used internally, (although some analogous preparations of the metal were,) at least in gastrodynia, pyrosis, and other gastric diseases, for which it is now so strongly recommended.

BISMUTHI SUBNITRAS. *A.*

Sub-nitrat of Bismuth. White Oxyd of Bismuth.

Take of
Bismuth, ... one ounce;
Nitric acid,
Water, each, . . . three fluid ounces.

Add the water and nitric acid together with agitation, then reduce the bismuth to powder in an iron mortar. Add it by small portions at a time to the diluted acid, and allow the vessel to remain at rest, until the metal is dissolved. Decant the clear solution into a large glass vessel, and for every fluid ounce of the liquid, pour in half a gallon of distilled water. When the white precipitate has subsided, pour off the supernatant liquid, and repeat the addition and decantation until the water comes off tasteless; collect the white powder, dry it without the application of heat, and keep it in a glass vessel secluded from light.

The dose of this article is from two to six grains, two or three times a day. It has scarcely any sensible effect beyond that of producing a remission of pain, and ultimately, a removal of the morbid state which gave rise to it. It is best given mixed with powder of gum arabic, sugar, or starch, in proportion of one grain of the medicine, to four or five of the powder of those substances.

Dr. Odier, of Geneva, first introduced this mineral into practice, and Dr. Marcet, physician to Guy's Hospital, London, and Dr. Bards-

ley, of the Manchester Infirmary, have experienced its medicinal powers; and Drs. Post, Osborn, and Stringham, of New-York, have added their testimony in favour of its efficacy, as an anti-spasmodic, particularly in cramps and other painful affections of the stomach.

In an inaugural dissertation by Dr. Samuel W. Moore, of New-York, it is the object of the author to present a knowledge of the medicinal powers of the white oxyd of bismuth, and to recommend its use in gastrodynia, pyrosis, cardialgia, and other affections of the stomach connected with dyspepsia. He relates several cases of the successful employment of the remedy, and from the most unquestionable authority, furnishes decisive evidence of its efficacy in the complaints abovementioned. In those affections of the stomach, whether from intemperance or other cause, which proceed from a want of tone in its muscular fibres, and where there is a disposition in that organ to generate acid, the oxyd of bismuth, it is said, effects a permanent cure, when alkalies and absorbent earths afford but temporary relief.

The reviewers of Dr. Moore's dissertation, in the New-England Medical Journal, after duly applauding the author, thus express their opinion of the utility of the oxyd of bismuth.

"The action of this substance on the stomach is that of a mild and effectual tonic; and from our own experience of its virtues, we do not hesitate to affirm with Odier, Marcet, Bardsley, and Moore, that in pyrosis, cardialgia, and more particularly gastrodynia, it operates more speedily, and with more certainty, than any other article of the materia medica. In the course of the last five years, we have frequently prescribed it in these forms of dyspepsia with almost uniform success; and although a medicine possessing such active properties might be supposed occasionally to produce some unpleasant effects on the system, we have never known any injurious consequences to result from its exhibition. A substance which discovers such qualities ought to be more generally known, and more frequently administered; for even on the supposition that it is capable of producing no greater effects than those of the medicines usually prescribed in these complaints, its use will be attended with the advantage of discarding in some measure from practice, the long continued employment of alcohol and bitters, which ultimately lessen the activity of the digestive organs, and either prolong or perpetuate the diseases they were intended to relieve."

BITUMEN. *A.* (*Secondary.*)

The term bitumen is very vague. It is impossible to say what kind is intended by the Convention, by this appellation. It is presumable they intended that which is known to the Colleges, under the name of Petroleum. This, therefore, we shall particularly notice.

Bitumen Petroleum. *E.* Petroleum. *L.*

Petroleum Barbedense. *D.* *Rock Oil Barbadoes Tar.*

Bitumen is now employed as the generic name for several inflammable bodies of different degrees of consistency, from perfect fluidity to that of a brittle but very fusible solid, and of little specific gravity. They are insoluble in alcohol or in water, combine with essential oils and sulphur, decompose only a small proportion of nitrat of potass by deflagration, and on inflammation leave little or no residuum.

Sp. 1. Naphtha. It is nearly as colourless, transparent, and fluid as water. Specific gravity 0.729 to 0.847, of a highly penetrating, yet not disagreeable smell, somewhat like that of rectified oil of amber, very volatile, and remaining fluid at 0° Fahrenheit.

Sp. 2. Petroleum. Not so fluid, transparent, or colourless, as the former; smell less pleasant. Specific gravity 0.878.

Sp. 3. Mineral Tar. Viscid; of a dark colour: smell sometimes strong, but often faint. Specific gravity 1.1.

Sp. 4. Mineral Pitch; maltha. Brittle in cold weather; of a dark colour; opaque. Specific gravity probably 1.07.

Sp. 5. Asphaltum. Very brittle; fracture conchoidal; glassy lustre; no smell, unless when melted or heated. Specific gravity 1.07 to 1.65. Fusible and inflammable.

According to Mr. Kirwan and Mr. Hatchett, the first species, by exposure to the air, and gradual decomposition, passes successively through the intermediate states, till at last it is converted into asphaltum. When partially decomposed, the remaining naphtha may be separated by distillation from the superabundant charcoal.

The first species, which is no longer officinal, is found abundantly in Persia; but what we receive comes from the dutchy of Modena in Italy It is very rarely met with in the shops; the second, mixed with a little of the third, and some subtile oil, is usually sent us instead of it.

Medical use.—Petroleum is at present very rarely employed as a medicine, though if the finer kinds could be procured genuine, they seem to deserve some notice: they are more agreeable than the oil of amber, and milder than that of turpentine; of the virtues of both of which they participate. They are principally recommended by authors for external purposes, against pains and aches, in paralytic complaints, and for preventing chilblains. For these intentions,

some of the more common mineral oils have been made use of with good success; an oil extracted from a kind of stone-coal has been extolled among the common people, under the name of British oil, for rheumatic pains, &c.; even this is often counterfeited by a small portion of oil of amber added to the common expressed oils. The Seneka oil of our own country is equal to any foreign article for the above purpose.

The Barbadoes tar is found in several of the West India islands, where it is esteemed by the inhabitants of great service as a sudorific, and in disorders of the breast and lungs; though in cases of this kind, attended with inflammation, it is certainly improper; they likewise apply it externally as a discutient, and for preventing paralytic disorders.

It is probable the oily substance which distils over in the gas light manufactories, would answer equally well and at a cheaper rate.

BOLETUS IGNIARIUS. *E.*

Female Agaric, or Agaric of the Oak. Touchwood. Spunk.

This fungus is frequently met with, on different kinds of trees, in Britain, especially the cherry and the plumb. The medullary part of this fungus, beaten soft, and applied externally, has been much celebrated as a styptic; and said to restrain not only venous but arterial hemorrhagies, without the use of ligatures. It does not appear, however, to have any real styptic power, or to act any otherwise than dry lint, sponge, or other soft fungous applications. It is best when gathered in August or September.

It has been analyzed by Bouillon Lagrange, who found it to contain, 1. An extractive matter soluble in water, sulphat of lime, and muriat of potass. 2. The residuum incinerated gave phosphats of lime, magnesia, and iron. 3. Alcohol extracted very little resin. The alkalies also indicated the presence of animal matter, but in less quantity than in the boletus agaricus, which also differed in containing a free acid and much resin.

C.

CALX. *A.—LIME.*

Calx, *recens usta. D. E. Quicklime. Lime recently burnt.*

This, like the other so called earths, is found to be a metallic oxyd.

Calcium. The base of lime is brighter and whiter than barium or strontium.

Lime is of a grey-white colour, warm, acrid and urinous to the taste; sp. gr. 2.33, soluble in 450 times its weight of water. It is apyrous; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphureted hydrogen, and phosphorus; it is very abundant in the mineral kingdom, and forms the basis of animal bones and shells. The calcareous spars, marble, limestone, chalk and marl, consist chiefly of lime.

Hydrat of Lime. When a small quantity of water is thrown upon fresh burnt lime, it is absorbed rapidly, with the extrication of considerable heat, and some phosphorescent light; at the same time the lime crumbles down into a very fine, white, dry powder, augmented much in bulk, but less caustic than before. Lime, thus slaked, does not renew these phenomena, on a further addition of water, but may be diffused or dissolved in it.

Lime is scarcely found in nature uncombined, but is easily prepared from any of its carbonats, either mineral or animal, by the action of fire, which first expels the water, and then destroys any animal matters which may be present, and, lastly, expels the carbonic acid. This process is improperly termed the burning of lime. The product is lime, or, as it is commonly called, quicklime.

As lime quickly attracts moisture and carbonic acid from the atmosphere, it should be always recently prepared; and when kept, it should be preserved in very close bottles. Lime should not effervesce with acids, and should be entirely soluble in water.

Medical use.—On the living body lime acts as an escharotic, and as such it was formerly applied to ill-conditioned and obstinate sores. Dissolved in water, it is sometimes given internally as a tonic or astringent in scrofula and various fluxes, and formerly it enjoyed considerable reputation as a lithontriptic. It is extremely useful in removing the scabby crusts in tinea capitis.

The London College have thought proper to introduce a formula for the preparation of lime, though it is an article so easily procured, as to seem to render it unnecessary. We, however, insert it.

Calx. *L.* *Lime.*

Take of
Limestone, one pound.
Break it into bits, and burn it for an hour in a crucible with a violent heat, or until the carbonic acid be totally expelled, so that on dropping on it acetic acid, no air bubbles are formed.

Lime may be made in the same manner from *oyster-shells,* after they have been washed in boiling water, and freed from all impurities.

If limestone is chosen, the purest sort is to be preferred.

AQUA CALCIS. *A. D. E.* Liquor Calcis. *L.*

Solution of Lime. Lime Water.

Take of
Lime, ... half a pound;
Boiling water, . . twelve pints.
Pour the water upon the lime and stir them together; next cover the vessel immediately, and let it stand for three hours; then keep the solution upon the remaining lime in stopped glass bottles, and pour off the clear liquor when it is wanted for use.

Lime absorbs water very rapidly with considerable heat and noise. This may be shown by sprinkling a little water on some dry quicklime. The above-mentioned phenomena will take place, and the lime will fall into powder, which has been called *hydrat of lime.* In this compound, the lime is to the water, according to Mr. Dalton, as 23 to 8; according to Davy, as 55 to 17; and to Berzelius, as 100 to 32.1. Some care, however, is necessary in its preparation, lest more water should be added, than is essential to its constitution. It affords a very convenient form of keeping lime, for occasional use, in a laboratory; for the hydrat may safely be preserved in glass bottles, which are almost constantly broken by the earth in its perfectly dry state. The hydrat of lime differs from those of barytes and strontites, in retaining its water much less forcibly; for the whole of it may be expelled by a strong red heat.

Lime is very sparingly soluble in water, viz. in the proportion of about 1 to 500; according to Thomson, 1 to 758; to Davy, 1 to 450; and to Dalton, at 60° Fahrenheit, 1 to 778. The experiments of Mr. Dalton tend to establish a curious fact, respecting the solubility of lime, viz. that it dissolves more plentifully in cold than in hot water. He has given the following table, the first column of which expresses the temperature of the water; the second, the number of grains of water, required to take up one grain of lime; and the third, the number required to dissolve one grain of hydrat of lime.

Temperature.	Grains of water that dissolve 1 gr. of lime.	Grains of water that dissolve 1 gr. of hydrat.
60°	778	584.
130°	972	720.
212°	1270	952.

At the freezing point, or nearly so, Mr. Dalton thinks it probable that water would take up nearly twice as much lime, as is dissolved by boiling water. *Henry's Chemistry.*

The Convention, in common with the Dublin and London Colleges, employs *boiling* water in this preparation. In spite of this authority, I am, however, constrained to ask the reason of this! I may also be allowed to animadvert on the direction given to pour the water on the lime and *stir them together;* now, as we are not told to take the lime in powder, it of consequence was intended to be in a solid mass; but how the stirring is to be effected until the lime falls down or is slaked, is difficult to comprehend. To say the least of the directions, they are deficient in perspicuity, as well in the above particulars, as in not stating in what kind of vessel the process should be conducted.

If the directions and observations to be found in every Dispensatory had been attended to, it would not have been amiss.

In making lime water, we should first add only so much water as is sufficient to slake the lime, which reduces it to a fine powder, easily diffused through water; for if we add more water at first, it forms a paste with the external part of the lime, and defends the internal from the action of the water. During the whole process, the air must be excluded as much as possible; as lime has a very strong affinity for carbonic acid, and attracts it from the atmosphere. The proportion of water used is scarcely able to dissolve one-tenth of the lime; but lime is of little value; and our object is to form a saturated solution quickly and easily. Lime is actually *more soluble in cold* than in hot water, therefore it is unnecessary to use boiling water. The keeping the lime water on the excess of lime is very judicious, as it will always be kept saturated, even if any carbonic acid is absorbed, for the carbonat being insoluble, falls to the bottom, and a fresh portion of lime is taken up. In this manner, a large bottle one-fourth filled with lime, will supply lime water for years, with only the trouble of supplying fresh water, when the other is poured off.

Lime water is transparent and colourless. It has an austere acrid taste, and affects vegetable colours as the alkalies do. Good lime water is precipitated white by alkaline carbonats, and orange by corrosive sublimate. It enters very readily into combination with all the acids, sulphur, and phosphorus; and decomposes the alkaline carbonats, phosphats, fluats, borats, oxalats, tartrats, and citrats; the ammoniacal acetats, muriats and succinats, the sulphats of alumine and magnesia, the metallic salts, spirituous liquors, and astringent substances.

Medical use.—When applied to the living fibre, lime water cor-

rugates and shortens it; it therefore possesses astringent powers. It is also a powerful antacid, or at least it combines with, and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills intestinal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity and debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy; in affections of the stomach accompanied with acidity and flatulence; when the intestines are loaded with mucus; and in worms. Lime-water is scarcely capable of dissolving, even out of the body, any of the substances of which urinary calculi consist; it has therefore no pretensions to the character of a lithontriptic. It has also been recommended in crusta lactea, in cancer, and in chronic cutaneous diseases. Externally, it is applied to ill-conditioned ulcers, gangrenous sores; as a wash in tinea capitis and psora; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder.

Lime-water combined with milk is found very advantageous in relieving the obstinate vomiting occurring in bilious, remitting and yellow fever.

When taken internally, its taste is said to be best covered by lukewarm milk. Its dose is commonly from two to four ounces, frequently repeated; but when long continued it weakens the organs of digestion.

CALCIS CARBONAS. *A.* *Carbonat of Lime.*

Carbonat of lime is obtained from both the mineral and animal kingdoms. It is the most common of all minerals; is found under a great variety of forms, and various names, as chalk, limestone, marble, spar. In form it is either amorphous, stalactical, or crystallized. When amorphous, its texture is either foliated, striated, granular, or earthy. The primitive form of its crystals is a rhomboidal parallelopiped. Hardness, lustre and transparency, various; when transparent, it causes double refraction; specific gravity from 2.315 to 2.75; colour, when pure, white; effervesces violently with muriatic acid, and dissolves entirely or nearly so in it, forming a colourless solution.

Its officinal varieties may be arranged under,

1. Soft carbonat of lime. *Chalk. Creta alba.*
2. Indurated carbonat of lime. *Marble. Marmor album.*

They contain about 45 parts of carbonic acid, and 55 of lime.

In medicine it is given to correct acidity in the primæ viæ, especially when accompanied with looseness. Powdered chalk has been externally applied with success to scalds and burns.

In pharmacy it is employed for the preparation of carbonic acid gas, and of the muriat of lime.

Lime, as a carbonat, has been prepared for medical purposes, from calcareous stones, and various shells, &c. under the names of

Prepared Oyster shells,
——— Egg shells,
——— Crab's eyes,
——— Crab's claws,
——— Coral, &c.

None of which are at all superior in a medical view, to the common chalk properly washed and levigated. It is true, they contain phosphat of lime and gelatin, but it is impossible to ascribe any virtues to them in the very small amount in which they exist.

CALCIS CARBONAS PRÆPARATUS. *A. E.*

CRETA PRÆPARATA. *L. D.*

Prepared Carbonat of Lime. Prepared Chalk.

Take of

Soft carbonat of lime, (chalk) one pound.

Add a small quantity of water to the carbonat of lime, and grind it into a fine powder; throw this powder into a large vessel full of water, then stir it, and after a short interval, pour the supernatant turbid solution into another vessel, and set it by, that the powder may subside; lastly, having poured away the water, dry the powder.

The coarse powder which the water could not suspend, may be levigated again and treated in the same manner.

In this manner are to be prepared,

Chalk—Coral—Crab's claws, first broken into small pieces, and washed with boiling water.

Oyster-shells and egg-shells, first cleaned from impurities;

And also amber, antimony, calamine, tutty, and verdigris.

The preparation of these substances merely consists in reducing them to an impalpable powder.

Medical use.—Carbonat of lime is commonly called an absorbent earth. It certainly is an antacid; that is, it combines with and neutralizes most acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the stomach accompanied with acidity, especially when at the same time there is a tendency to diarrhœa. The fear of forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonat of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers probably arises entirely from its imbibing the moisture or ichorous matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

CRETA PRÆCIPITATA. *D.* *Precipitated Chalk.*

Take of

Water of muriat of lime, any quantity.

Add as much carbonat of soda, dissolved in four times its weight of distilled warm water, as is sufficient to precipitate the chalk. Wash the matter which falls to the bottom three times, by pouring on, each time, a sufficient quantity of water. Lastly, having collected it, dry it upon a chalk stone, or paper.

This preparation affords carbonat of lime in its purest state, and, although expensive, may be employed when it is intended for internal use. It is nevertheless a very unnecessary preparation ; the preceding prepared carbonat being no ways inferior as a medicine, if proper attention is paid to its preparation.

This may be considered as an affectation of perfection.

LIQUOR CALCIS MURIATIS. *A. L.*

SOLUTIO MURIATIS CALCIS. *E.* AQUA MURIATIS CALCIS. *D.*

Liquor, or Water, or Solution of Muriat of Lime.

Take of

Hard carbonat of lime, broken in pieces, . . . nine ounces;
Muriatic acid, ... sixteen ounces;
Water, ... half a pint.

Mix the acid with the water, and gradually add the pieces of lime. When the effervescence has ceased, digest them for an hour, pour off the liquor, and evaporate to dryness. Dissolve the residuum in its weight and a half of water, and, lastly, filter the solution.

From the difficulty of crystallizing this salt, it is directed by the Edinburgh College to be evaporated to the total expulsion of its water of crystallization, as being the surest way of obtaining a solution of uniform strength. With the same view, the Dublin College saturate muriatic acid of a given strength ; and Dr. Wood directs, that the solution should always have a determinate specific gravity.

It may be economically prepared from the residuum in the decomposition of muriat of ammonia, by lime and chalk, according to the directions of the Berlin Pharmacopœia, now adopted by the London College, by watery fusion, solution, filtration, and crystallization. Its purity is ascertained by its remaining colourless and transparent, with infusion of galls and caustic ammonia ; a brown colour indicating the presence of iron, and a precipitation that of alumina. But it may be purified by boiling it in solution an hour, with a sufficient quantity of pure chalk, or other carbonat of lime, filtrating it, evaporating it gently, till it acquire the specific gravity

of 1.5, allowing it to stand some days in a corked bottle, decanting it from the sediment, and duly evaporating it.

The crystals of this salt are prisms of six smooth and equal sides, but they are often so aggregated, that they can only be termed acicular. Its taste is pungent, bitter, and disagreeable. When heated, it melts, swells, and loses its water of crystallization, and, at a very high temperature, a small part of its acid. It is one of the most deliquescent salts known, and is so soluble, that water seems capable of dissolving twice its weight, or, at least, forms with it a viscid liquor; but as it is still capable of attracting moisture from the air, and of emitting caloric, when farther diluted, it can scarcely be considered as a true solution. It is soluble in alcohol, and its solution burns with a crimson flame. It is decomposed by the sulphuric, nitric, phosphoric, fluoric, and boracic acids; by baryta, potass, soda, and strontia; by most of the sulphats, sulphites, nitrats, phosphats, fluats, borats, and the alkaline carbonats. Crystallized, it contains 31 acid, 44 lime, and 25 water; dried at a red heat, 42 acid, 50 lime, and 8 water.

Medical use.—It was first proposed as a medicine by M. Fourcroy, and has been lately extolled in scrofulous and glandular diseases, and cases of debility in general, by several eminent practitioners, Dr. Beddoes, Dr. R. Pearson and Dr. Wood. Thirty drops of the solution are a sufficient dose for children, and a drachm for adults, repeated twice or thrice a-day. In an over-dose it has produced qualms and sickness; and three drachms and a half killed a dog, the stomach of which, upon dissection, had its villous coat bloodshot, and in many parts almost black, and converted into a gelatinous slime. Perhaps it is the muriat of lime which is the active ingredient in the lotions prepared by triturating calomel or corrosive sublimate in lime-water. The compound resulting is a solution of muriat of lime, with oxyd of mercury diffused through it. The property of this salt, of producing intense cold during its solution, might also be applied to medical use. For this purpose it might be economically prepared, by saturating with muriatic acid the residuum of the distillation of ammonia or of carbonat of ammonia. Its strong affinity for water and alcohol, fits it for the rectification of alcohol and ether.

This salt may be prepared in any amount by the makers of the mineral waters, by merely extricating the carbonic acid with muriatic acid. A muriat of lime would be left, which might be evaporated to dryness, redissolved and crystallized, and a solution of proper strength formed.

CALCIS PHOSPHAS. *A.* *Phosphat of Lime.*

This will be noticed under the head of *Cornu Cervinum.* It is rather extraordinary that its mode of preparation is not given in the New Pharmacopœia. Did the Convention imagine the apothecaries were to look to other sources of information besides them.

CAMPHORA. *A. E. L. D.* *Camphor.*

A peculiar Vegetable Principle.

Camphor is a concrete friable substance, of a white colour, with a considerable degree of transparency, and a crystalline appearance, specific gravity 0.9887. Its taste is bitter and acrid, and its smell penetrating and peculiar. It is evaporated unchanged by a heat of 145°, but may be melted by suddenly exposing it to 302°. The vapour when condensed crystallizes in hexagonal plates. Its vapour is exceedingly inflammable, and when kindled it burns with a white flame and a great deal of smoke, and leaves no residuum. The products of its combustion are carbonic acid gas, charcoal, and water. Camphor is soluble in alcohol and in the acids. From these solutions it is precipitated by water. It is also soluble in hot oils, both volatile and fixed, but on cooling separates from them in plumose crystals. It is insoluble in water, and is not acted on by the alkalies, metals or metallic oxyds. By repeated distillation with nitric acid, it is converted into a peculiar acid. It exists in many vegetables, but is chiefly procured from the laurus camphora.

The camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in greenhouses in England. Every part of the tree smells strongly of camphor, which is obtained from the trunk, branches, and root, by distillation. They are cut down into small pieces, and put into a still with a quantity of water. After the water has been kept boiling forty-eight hours, the camphor is found adhering to the straw with which the head of the still is lined. In this state it is imported by the Dutch, and is called crude camphor. It is very impure, consisting of small brownish or dirty-grey grains, mixed with straw, wood, hair, and other impurities. From these it is purified in Holland, by a second sublimation in glass vessels; being previously mixed with quicklime, to combine with and prevent any empyreumatic oil with which it may be contaminated from subliming, while the camphor concretes in the upper part of the vessel into cakes, convex on one side, and concave on the other, about two or three inches thick, thinner at the edges, and generally perforated in the middle.*

Pure camphor is lighter than water, very white, pellucid, somewhat unctuous to the touch, brittle, yet tough and elastic, so as to be scarcely pulverizable; shining in its fracture, and crystalline in its texture; of a bitterish, aromatic, pungent taste, yet accompanied with a sense of coolness; of a strong and very penetrating smell; very volatile, inflammable, burning entirely away without leaving any coal or ashes; capable of combining with the fixed and volatile oils, resins, and balsams; soluble in alcohol, ether, and the concentrated sulphuric, nitric, and acetic acids; separable from these alcoholic and acid solutions by water; insoluble in water, alkalies,

* For the method of purifying Camphor, see an account by Professor Woodhouse, in the Philadelphia Medical Museum, Vol. I. p. 197.

and the weaker acids; decomposable by heat when mixed with alumina, being converted into an essential oil and charcoal, and by treating it with nitric acid, which acidifies it, producing camphoric acid.* With sulphuric acid, it forms artificial tannin.

But the production of camphor is not confined to the laurus camphora, although it furnishes almost all the camphor of commerce; it is found in very great purity in interstices among the woody fibres of an unknown tree in Borneo; it is also contained in the roots of the laurus cinnamomum and cassia, Alpinia galanga, amomum zedoaria, &c.; in the seeds of the amomum cardamomum, piper cubeba, &c.; and in many indigenous plants, as in the thymus serpyllum and vulgaris, juniperus communis, rosmarinus officinalis, salvia officinalis, mentha piperita, &c., and may be separated from the essential oils of rosemary, lavender, marjoram and sage. It is therefore now universally considered as a peculiar principle of vegetables, and not as a resin, as stated by the Dublin College. It is also now well known to be produced by the action of muriatic acid gas on oil of turpentine, in considerable amount. This camphor, which I have frequently prepared, appears to me to possess every property of common camphor. From the similarity in some respects of the oil of turpentine, and of sassafras, I expected to procure it from this last by a similar process; but it does not yield it.

Medical use.—Camphor is a very active substance when taken into the stomach. It increases the heat of the body considerably, and gives a tendency to diaphoresis, but without quickening the pulse. At first it raises the spirits, but produces a subsequent depression; and it facilitates voluntary motion. In excessive doses it causes syncope, anxiety, retchings, convulsions, and delirium. These violent effects of camphor are most effectually counteracted by opium.

In a morbid state of the body, camphor allays inordinate action. When the pulse is hard and contracted, it renders it fuller and softer. It removes spasms, and flitting pains arising from spasms; and in delirium, when opium fails of procuring sleep, camphor will often succeed. It is also said to correct the bad effects of opium, mezereon, cantharides, and the drastic purgatives and diuretics.

The most general indication for the use of camphor, is the languor or oppression of the *vis vitæ*. It may therefore be given with advantage,

1. In all febrile diseases of the typhoid type, especially when attended with delirium.
2. In inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism.

* Camphoric acid crystallizes in white parallelopipeds of a slightly acid bitter taste, and smell of saffron, efflorescing in the air; sparingly soluble in cold water; more soluble in hot water; soluble in alcohol, the mineral acids, volatile and unctuous oils, melting and subliming by heat.

Camphorats have commonly a bitter taste, burn with a blue flame before the blowpipe, and are decomposed by heat, the acid subliming.

3. In eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has suddenly receded, as in small-pox, measles, &c.
4. In many spasmodic diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.
5. In indolent local inflammations, not depending upon an internal cause, to excite action in the part.

As from its great lightness it is apt to swim upon the contents of the stomach, and to occasion pain at its upper orifice, it is necessary that it be always exhibited in a state of minute division. In order to reduce it to powder, it must be previously moistened with a little alcohol. It may then be given,

1. In powder, with sugar, magnesia, and nitrat of potass.
2. In pills, with the fetid gums, and mucilage.
3. In solution, in alcohol, oil, or acetic acid.
4. Suspended in the form of an emulsion, by means of mucilage, sugar, yolk of egg, almonds, vinegar, &c.
5. The best mode of administering camphor seems, by triturating it with milk; this fluid suspends it very largely. It has been said to *dissolve* it; but from my experiments on this point, I believe it is an error; for in a few days I always found the camphor precipitated, and the putrefactive fermentation of the milk appeared nearly as rapidly, as if no camphor had been combined with it.

Internally, it may be given in small doses, of from one to five grains, repeated at short intervals, as its effects are very transient, or in large doses, not under twenty grains.

CANELLA. *A.* CANELLA ALBA. *L. E. D.*

Canella Alba. Wild Cinnamon. The Bark.

The canella alba is a tall tree, which is very common in Jamaica, and other West-India islands.

The canella is the interior bark, freed from an outward thin rough one, and dried in the shade. The shops distinguish two sorts of canella, differing from each other in the length and thickness of the quills: they are both the bark of the same tree, the thicker being taken from the trunk, and the thinner from the branches.

It is brought to us rolled up in long quills, thicker than cinnamon, and both outwardly and inwardly of a whitish colour, lightly inclining to yellow. It is a warm pungent aromatic, not of the most agreeable kind; nor are any of the preparations of it very grateful. Infusions of it in water are of a yellowish colour, and smell of the canella; but they are rather bitter than aromatic. Tinctures in rectifi-

ed spirit have the warmth of the bark, but little of its smell. Proof spirit dissolves the aromatic as well as the bitter matter of the canella, and is therefore the best menstruum. It must not be confounded with the bark of the wintera aromatica.

Medical use.—Canella alba is often employed where a warm stimulant to the stomach is necessary, and as a corrigent of other articles. It is useful as covering the taste of some other articles. It is considered by many as a powerful antiscorbutic. Dose of the powder, ten to twenty grains.

CANTHARIDES. *A.* CANTHARIS VESICATORIA. *E.* MELOE VESICATORIUS. CANTHARIS. *D.* LYTTA. *L.*

Cantharides. Spanish Fly. Blistering Fly, &c. &c.

The Dublin term *cantharis*, I think preferable to the others. The use of the plural *cantharides*, would seem to imply that a *single fly* was incapable of producing the effect of vesication. It is true, this is of little importance, but the opportunity of fixing on the most correct term having occurred, I should have been better satisfied if the Convention had adopted it.

These insects have a longish, green, and gold-shining body, with flexible green-striped elytra, which cover the whole back of the body, and under which are their brown membranous wings. On their head they have two black articulated feelers. They are found on the fraxinus, sambucus, salix, ligustrum, &c. in Spain, Italy, France, and Germany. The largest come from Italy, but the Spanish cantharides are preferred. They are gathered by shaking the trees on which they are found, and catching them on a cloth spread beneath it. They are then killed by the fumes of vinegar, and dried carefully in a stove. The melolontha vitis is sometimes found mixed in considerable numbers with the cantharides. They are easily distinguished by their almost square body, and as probably they do not stimulate the skin, they should be picked out before the cantharides are powdered.

A species of meloe with vesicating properties is described in the Asiatic Researches, vol. v. 213, as employed in the East Indies.

The analysis of cantharides is still imperfect. Neumann got from 1920 grains, 920 watery, and afterwards 28 alcoholic extract; and inversely, 400 alcoholic, and 192 watery. Lewis ascertained that their active constituent is entirely soluble, both in water and in alcohol; for extracts made with each of these solvents blistered, as far as could be judged, equally, and as effectually as cantharides in substance. Both the residua were inactive. Thouvenel considered the vesicating power to reside in a green matter of an oily nature. Beaupoil in two substances, one yellow and the other black, both soluble in water, but separable by alcohol. Lastly, Robiquet, in a very de-

tailed analysis, says, that neither of these three principles blisters of itself; but that this property is owing to their combination with a particular white crystalline substance, soluble in warm alcohol, separating as it cools, soluble in oils, and insoluble in water. He also found, besides known principles, free acetic acid, phosphat of magnesia, a reddish yellow oil insoluble in alcohol, and, lastly, uric acid.

To this peculiar vesicating principle, Dr. Thomson has given the name of cantharidin. *Cantharin* would have been better, for the preceding reasons in respect to the name.

The activity of cantharides is long preserved. Van Swieten has mentioned their use after thirty years, and I have experienced the same in some of nearly the same age. It is curious, that acrid as these insects are, they are reduced to dust by others feeding upon them. It is, however, the inert parenchymatous portion which they select, and the residue is extremely active.

Medical use.—Cantharides have a peculiar nauseous smell, and an extremely acrid, burning taste. Taken internally, they often occasion a discharge of blood by urine, with exquisite pain: if the dose be considerable, they seem to inflame and ulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fetid and cadaverous; intense pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrids, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat.

The inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, emulsions, &c. The specific property of counteracting cantharides ascribed to camphor, has no foundation.

The internal use of cantharides is at all times doubtful, and requires the most prudent management. They have, however, been sometimes employed with success in dropsy, and in diseases of the urinary organs, arising from debility. They are given in substance in very small doses, or in tincture.*

Applied externally, they are one of our best and most powerful remedies. By proper management, they may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

* The tincture has been of late much recommended in tetanus, &c. and doubtless it has proved useful in some instances. That it will not do to depend on this alone, is evident from a case which fell under my care, (see Philadelphia Medical Museum, vol. 1.) in which in two weeks the patient took about 2000 drops of the tincture. One thousand of these were exhibited in the space of ten hours, in doses of 100 drops an hour, without any effect. Dr. Chapman states, from experiment, that a blister is very speedily and certainly raised by the application of the cantharides until their rubefacient operation is produced; they are then to be removed, and a warm poultice is applied, by which the cuticle is very quickly distended.

Blisters are applied,

1. To increase the activity of the system in general, by means of their irritation.
2. To increase the activity of a particular organ.
3. To diminish morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brain, lungs, or liver, be at the same time particularly affected. In these cases the blisters are not applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in any organ, the blisters are, if possible, applied directly to the diseased organ.

Cantharides are employed externally, either in substance, mixed up with wax and resin, so as to form a plaster or ointment, or in the form of tincture.

CANTHARIDES VITTATÆ. *A.*

Lytta Vittata. *Potatoe Flies.*

There are four species of meloe that blister, found in the United States. The lytta vittata was first brought into notice by Dr. Isaac Chapman, of Buck's county, Pennsylvania. It feeds principally upon the potatoe vine, and, at the proper season of the year, may be collected in immense quantities. This insect has a very near resemblance, in its outward form, to the meloe vesicatorius, or Spanish fly; but is rather smaller, and of a very different colour; the head is a very light red, with black antennæ; the elytra or wing cases are black, margined with pale yellow, and a stripe of the same colour extends along the middle of them; the tarsi have five articulations; the mouth is armed with jaws, and furnished with tarsi.

In the abdomen of this fly, is a hard, white substance, about the size of a grain of wheat, which, when powdered, appears like meal, and, when rubbed with water, forms a milky emulsion.

The experiments and investigation of Dr. Chapman have proved, that, when applied to the human system, the effects of the potatoe fly are perfectly analogous to those of the Spanish cantharis; being equal, if not superior to them in medicinal powers.* The lytta vittata is now introduced into the Materia Medica of the Massachusetts Pharmacopœia, and its properties have been made the subject of a valuable communication to the Medical Society of Massachusetts, by Dr. John Gorham of Boston. From this interesting paper, it appears, that for some years past, the potatoe fly has been employed as a vesicatory by Dr. Israel Allen, of Sterling. That the insect in its dried state, is from four to six lines in length, its head and elytra are uniformly black, and the latter want the margin and stripe of yellow, observable in that described by Dr. Chapman. Its

* Med. Repos. Vol. II.

belly is ash coloured, and in the cavity of the abdomen is found the hard white substance already described. The thickness of the potatoe fly, which is nearly uniform throughout, is from one quarter, to one third its length. It generally appears on the vines, about the end of July, and the first week in August. They inhabit the soil at the foot of the plant; they ascend in the morning and afternoon, but generally avoid the heat of the sun at noon. As they fly with great difficulty, they are easily caught, and are prepared for medicinal purposes, by shaking them from the plant into hot water, and afterwards drying them by the sun's rays. Dr. Gorham proceeds to observe, that he has instituted an extensive series of experiments with the lytta vittata; and that they have never failed, even in a single instance, of producing all the immediate effects which he anticipated, from their external application, or internal exhibition: as a vesicatory, he has found them equal, if not superior to the cantharis usually employed for that purpose in this country. The saturated tincture has been administered internally, in many cases of diminished sensibility of the urinary organs, in gleets, and as a diuretic in dropsy; and it has been found, in all, to increase the discharge of urine, and to produce a considerable irritation in the urethra, and in the neck of the bladder. It appears, therefore, from the combined testimony of Drs. Chapman, Gorham, and Allen, that physicians in various parts of the country, may collect from their own fields, an annual visitor, possessing all the properties of the genuine cantharis. This indigenous production cannot fail of being generally adopted, as an excellent substitute for an expensive exotic, not always to be obtained.

We shall notice another kind of indigenous blistering fly, the *meloe niger* of Professor Woodhouse, or the Pennsylvanicus of Linnæus. This is not more than half the size of Chapman's fly, and is uniformly black. It feeds upon the *prunella vulgaris*, or self-heal, and *ambrosia trifida*, or stick-weed. During the month of August, the farmers of New England find them in immense quantities, extracting nourishment from the potatoe vine, which in some seasons they almost destroy. These flies, it is well ascertained, are not inferior in point of efficacy to any other species, whether of foreign or domestic production, and they seldom excite strangury when applied externally.

It has lately been stated, that the same principle (canthariden) has been obtained from the fly under consideration.

CAPSICUM. *A.* *Cayenne Pepper. The Fruit.*

CAPSICUM ANNUUM. *E. L. D.* *Cockspur Pepper.*

This is an annual plant, a native of South America, but cultivated in large quantities in the West-India islands; and it will even ripen its fruit in Great Britain.

The pods of these species are long, pointed, and pendulous, at first of a green colour, and afterwards of a bright orange red. They are filled with a dry loose pulp, and contain many small, flat, kidney shaped seeds. The taste of capsicum is extremely pungent and acrimonious, setting the mouth as it were on fire.

The pungency of Cayenne pepper is soluble in water and in alcohol, is not volatile, reddens infusions of turnsole, and is precipitated by infusion of galls, nitrat of mercury, muriat of mercury, nitrat of silver, sulphat of copper, sulphat of zinc, red sulphat of iron, (but not blue or green,) ammonia, carbonat of potass, alum, but not by sulphuric, nitric, or muriatic acid, or silicized potass.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum, but especially of the capsicum frutescens or bird pepper, which is the hottest of all. Cayenne pepper, as it comes to us from the West-Indies, changes infusion of turnsole to a beautiful green, probably owing to the muriat of soda, which is always added to it, and red oxyd of lead, with which it is said to be adulterated.

Medical use.—These peppers have been chiefly used as a condiment. They prevent flatulence from vegetable food, and have a warm and kindly effect in the stomach, possessing all the virtues of the oriental spices, without, according to Dr. Wright, producing those complaints in the head which the latter are apt to occasion. An abuse of them, however, gives rise to visceral obstructions, especially of the liver. But of late they have been employed also in the practice of medicine. There can be little doubt that they furnish us with one of the purest and strongest stimulants which can be introduced into the stomach; while at the same time they have nothing of the narcotic effects of alcohol or opium. Dr. Adair Makitrick, who first introduced them into the practice of medicine, found them useful, particularly in that morbid disposition which he calls *Cachexia Africana*, and which he considers as a most frequent and fatal predisposition to disease among the slaves. Dr. Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capsicum forms an excellent addition, and recommends its use in lethargic affections. This pepper has been also successfully employed in a species of cynanche maligna, which proved very fatal in the West-Indies, resisting the use of Peruvian bark, wine, and the other remedies commonly employed. In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capsicum have a speedy and happy effect. They redden the parts, but seldom blister, unless when kept on too long. In ophthalmia from relaxation, the diluted juice of capsicum is a sovereign remedy. Dr. Adair gave six or eight grains for a dose, made into pills, or prepared a tincture, by digesting half an ounce of the pepper in a pound of alcohol, the dose of which was one or two drachms diluted with water.

Red lead may be detected in it, by digesting it in acetic acid, and adding to the solution sulphuret of ammonia, if lead is present, a dark coloured precipitate is produced; or, boil some of the sus-

pected pepper in vinegar, filter the solution, and add sulphat of soda; a white precipitate of sulphat of lead is formed, which, dried, and exposed with a little charcoal to heat, will yield a metallic globule of lead.

CARBO.—*CARBON.*

Carbon, in a state of great purity and extreme aggregation, is well known by the name of *diamond.* It possesses a very high degree of lustre, transparency, hardness, and refractive power. It is crystallized, and generally colourless. Its specific gravity is about 3.5. It is insoluble in water, and can neither be melted nor vaporized by caloric. It is a non-conductor of electricity. It is not acted upon by any chemical agent, except oxygen, at very high temperatures. When exposed in oxygen gas to the rays of the sun, concentrated by a very powerful lens, its surface becomes sensibly blackened; it is ignited, and at last consumed. The result of this combustion is carbonic acid gas, which is exactly equal in volume to the oxygen gas consumed; and 100 parts of it consist, according to Messrs. Allen and Pepys, of 28.6 of carbon, and 71.4 of oxygen by weight. It combines with iron, forming steel. It is a constituent of almost all animal and vegetable substances; and is obtained from them by exposing them to heat in close vessels.

Plumbago and *incombustible coal* are carbon in a state of less aggregation and somewhat impure. In the former, it is combined with about $\frac{1}{25}$ of iron; in the latter with earthy matter. The most remarkable known property of these substances is the very high temperature necessary for their combustion.

Common *charcoal* of wood, is another, and the commonest form of carbon. It is obtained in the form of solid masses, of a black colour, and more than twice as heavy as water. It has neither smell nor taste. It is brittle, and never crystallized; it rapidly attracts moisture, so as to acquire from 12 to 14 *per cent.* of weight. When dry, it also absorbs several times its bulk of any gas in which it is placed. It absorbs light strongly, is refractory in the fire, insoluble in water, and a bad conductor of caloric, but an excellent one of electricity. At a red heat, it burns rapidly in oxygen gas; 28.6 of charcoal, and 71.4 of oxygen, forming 100 of carbonic acid gas. It also burns in atmospheric air, but less vividly. In vacuo, and in gases on which it has no action, it is slowly volatilized by the highest power of galvanism. Common charcoal always furnishes a little water on its combustion; but charcoal from the decomposition of oil gives carbonic acid alone.

Gaseous oxyd of carbon (carbonic oxyd gas) is carbon in its first degree of oxydation. It is invisible and elastic; 100 cubic inches weigh about 30 grains, or its specific gravity to hydrogen is 13.2. It

does not support combustion or respiration. With oxygen gas it burns with a lambent blue flame, and is converted entirely into carbonic acid, without producing any moisture. It has no affinity for lime. It consists of about 4 carbon, and 56 oxygen. When mixed with an equal bulk of chlorine, and exposed to the direct rays of the sun, they unite, are condensed to one half, and form a peculiar gas discovered by Dr. John Davy.

Carbonic acid gas is transparent, colourless, without smell, irrespirable, and incapable of supporting combustion. 100 cubic inches weigh 47 grains, or its specific gravity to hydrogen is 20.7. Water at 41° absorbs an equal bulk of it, and acquires a specific gravity of 1.0015, an agreeable vascidity, and a sparkling appearance, especially if heated to 88°. It is separated from water by freezing or boiling. It is also absorbed by alcohol, volatile and fixed oils. It contains 28.6 carbon, and 71.4 oxygen. Its compounds are called carbonats.

Carbureted hydrogen gas is the gas evolved in stagnant waters. It has no taste, but a disagreeable empyreumatic smell. 100 cubic inches weigh about 17 grains, and its specific gravity is rather less than 8. It is incapable of supporting respiration or combustion. It burns with a bright yellowish flame, consuming two parts of oxygen gas. It detonates with two of chlorine by the electric spark, forming four of muriatic acid gas.

Supercarbureted hydrogen or *Olefiant gas.* 100 cubic inches weigh between 29 and 30 grains, or its specific gravity is 13. It does not support respiration or combustion. It burns with a splendid white flame, and detonates by the electric spark with great violence, with three volumes of oxygen. With an equal volume of chlorine, it forms a fluid resembling an oil.

Chloride of carbonic oxyd was discovered by Dr. John Davy, who called it phosgene gas. It consists of equal volumes of chlorine and carbonic oxyd gases; is colourless, has a suffocating smell like chlorine, affects the eyes. It reddens turnsole. 100 cubic inches weigh 111.91 grains. It does not support combustion, and is not decomposed by any of the simple combustibles, but is acted upon by zinc, antimony, arsenic, and other metals, which absorb the chlorine, and disengage the carbonic oxyd, while the oxyd disengages carbonic acid. It is decomposed by water, and alcohol dissolves twelve times its volume.

Carbo-chloride of ammonia. The preceding gas unites with four times its bulk of ammoniacal gas, forming a neutral salt, solid, white, volatile, pungent, deliquescent, and very soluble in water, which is decomposed by the sulphuric, nitric, muriatic, and phosphoric acids.

CARBO LIGNI. *A. E. L. D.*

Charcoal of Wood.

Charcoal, as it is commonly prepared, is not a pure oxyd of carbon, but contains also a notable proportion of hydrogen, from which it may be purified by exposing it for some time to a strong heat. Münch directs, that for medical use it be reduced to fine powder, and heated in a covered crucible as long as any flame appears, on removing the cover, and until it be fully red. It is to be allowed to cool in the furnace, the upper layer of the powder to be removed, and the remainder to be sealed accurately up in ounce vials.

Medical use.—When the pneumatic pathology was in fashion, and phthisis and similar diseases were ascribed to hyper-oxygenation of the system, charcoal was strongly recommended as a powerful disoxygenizing remedy, and cases of its successful employment are even recorded.

In this place it will not be superfluous to notice the power ascribed to charcoal of purifying various fetid or discoloured fluids; Lowitz found that it destroyed the adventitious colour and smell of vinegar, carbonat of ammonia, tartaric acid, alcohol, super-tartrat of potass, and other salts, and that it prevented water from becoming putrid at sea, especially when assisted by a little sulphuric acid. Meat which has acquired a mawkish, or even putrid smell, is also said to be rendered perfectly sweet by rubbing it with powdered charcoal.

From its acknowledged effects in correcting the putridity of animal substances, it is probable that the virtues ascribed to it of preventing the putrid eructations which take place in some kinds of dyspepsia are not unfounded. Ten grains may be given for a dose. A table spoonful taken two or three times a day, with syrup of roses, is said to remove habitual costiveness. In the additions to the German translation of the third edition of this Dispensatory, we are informed that Hahnemann and Juch found that charcoal taken to the extent of two drachms daily, completely took away the fetor of the stools of dysenteric patients. It is also said to be useful in the itch, worms, florid phthisis, scrofula, and other atrophies. The latest extension of the use of charcoal as a remedy, is for the cure of intermittent fevers, by Dr. Calcagno of Palermo, and his success has been corroborated by Dr. Calvert, and other army practitioners on that station. A scruple of the powder was given as a dose three times a day, or every three hours, and the patients generally recovered before they had taken two ounces. It was also used with advantage in dysentery. Dr. Calvert says, its general effects seemed to be "to take away bitter and disagreeable tastes in the mouth, to allay sickness, wherever there is a tendency to vomit, and sometimes to stop the vomiting when it has occurred, to promote appetite, and to assist digestion. It has some tendency, however, to constipate the bowels, but it neither produces griping, nor any other unpleasant symptom." As an external application, powdered char-

coal has been recommended in the cure of inflammation from external causes, gangrene, and all descriptions of fetid ulcers. The good effects of charcoal, or burnt bread, used as a tooth powder, in correcting the bad smell which the breath sometimes acquires from carious teeth, are well known. It is applied in powder to tinea capitis.

Charcoal is of such importance in medicine and the arts, that it has been made from various substances, partly under the impression of some particular advantage ; and it does appear to vary somewhat, according to the source of its derivation. This must be imputed, however, solely to the adventitious articles in combination. Some of these are mentioned here.

Burnt sponge, hereafter to be noticed.

Ivory black. Ebur ustum, from burnt ivory shavings; but most commonly its place is supplied by bone black. It is used as a dentifrice and as a paint.

Lamp black. From the combustion of resinous bodies, &c. in furnaces of a peculiar construction ; used as a paint. If any plan could be contrived for collecting it, a most abundant supply might be obtained from the chimnies of the steam-boats.

Wood soot. Fuligo ligni. Vegetable Æthiops, from the fucus vesiculosus burnt.

Frankford black, made from the lees of wine and vine twigs, for printer's ink.

Noir d'Espagne, from cork burned in close vessels, used in painting, and celebrated by some, as a medicine in diseases of the bowels, &c.

Carbon united as before mentioned with oxygen in certain relative proportions, constitutes carbonic acid ; and the term of Carbonat is applied as a generic name for the combinations of carbonic acid with the earths, alkalies, and metallic oxyds.

The nature of these substances was totally unknown, until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made ; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonats were supposed to be simple bodies ; and the fact of their acquiring new and caustic properties by the action of fire, was attempted to be explained by supposing that the particles of the fire combined with them. Dr. Black, however, demonstrated by proofs which carried universal conviction along with them, that these bodies in their caustic state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonic is now given.

The *carbonats* always preserve their alkaline properties in some slight degree. They are decomposed by all the acids, forming a brisk effervescence, (which is colourless, when any of the stronger acids are poured upon them. This phenomenon is owing to these

acids displacing, by their greater affinity, the carbonic acid, which flies off in the form of a gas.

The carbonats may be also deprived of their carbonic acid, either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonic acid by combining with part of its oxygen, so that both the acid and the charcoal are converted into carbonic oxyd gas.

The carbonats may be divided into three great families, the alkaline, the earthy, and the metallic.

Family 1. The alkaline carbonats have an urinous taste, tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2. The earthy carbonats are insipid, and insoluble in water, but soluble in water saturated with carbonic acid.

Family 3. The metallic carbonats scarcely differ in appearance from the metallic oxyds.

The *officinal* carbonats, are those of barytes, lime, magnesia, potash, soda, ammonia, zinc, and iron, which are respectively mentioned.

CARDAMINE PRATENSIS. *E. L. D.*

Meadow Ladies Smock. Cuckow Flower. The Flowers.

The Cardamine is a perennial plant, which grows in meadow-grounds, sends forth purplish flowers in the spring; and in its sensible qualities resembles the *sisymbrium nasturtium.*

Medical use.—Long ago it was employed as a diuretic; and of late it has been introduced in nervous diseases, as epilepsy, hysteria, chorea, asthma, &c. A drachm or two of the powder is given twice or thrice a day. It has little sensible operation, except that it sometimes acts as a diaphoretic.

CARUM. *A. Caraway.*

Carum Carui. *E. D. L. Common Caraway. The Seeds.*

Caraway is a biennial umbelliferous plant, cultivated in gardens, both for culinary and medicinal use. The seeds have an aromatic smell, and warm pungent taste, and yield much essential oil.

Medical use.—They are employed as stomachic and carminative in flatulent colics.

CASSENA. Ilex Vomitoria *of Aiton.*

South-Sea-Tea; Evergreen Cassine; Cusseena—Yaupon, or Yopon.

This is a native of Carolina, West Florida, &c. and is thought to be one of the most powerful diuretics hitherto discovered. It also vomits severely. It is much esteemed by the southern Indians.*

CASCARILLA. *A.*

Croton Cascarilla. *L. D.* Eleutheria. *E.*

Eleutheria, or *Cascarilla. The Bark.*

This bark is imported into Europe from the Bahama Islands, and particularly from one of them of the name of Eleutheria; from which circumstance it was long known by the title of Eleutheria. But Dr. Wright also found the tree on the sea-shore in Jamaica, where it is common, and rises to about twenty feet. It is the Clutia eluteria of Linnæus: the bark of whose Croton cascarilla has none of the sensible qualities of the cascarilla of the shops.

The cascarilla is in general brought to us either in curled pieces or rolled up into short quills, about an inch in width, somewhat resembling in appearance the Peruvian bark. It is covered with a rough whitish epidermis; and in the inside it is of a brownish cast. When broken, it exhibits a smooth, close, dark-brown surface.

This bark, when freed from the epidermis, which is insipid and inodorous, has a light agreeable smell, and a moderately bitter taste, accompanied with a considerable aromatic warmth. It is easily inflammable, and yields, when burning, a very fragrant smell, resembling that of musk; a property which distinguishes the cascarilla from all other barks.

Its active constituents are aromatic essential oil and bitter extractive. Its virtues are partially extracted by water, and totally by rectified spirit; but it is most effectual when given in substance.

Medical use.—It produces a sense of heat, and excites the action of the stomach; and it is therefore a good and pleasant stomachic, and may be employed with advantage in flatulent colics, internal hemorrhagies, dysenteries, diarrhœas, and similar disorders.

As the essential oil is dissipated in making the extract, this preparation acts as a simple bitter. It was much employed by the Stahlians in intermittent fever, from their fear of using Cinchona bark, to which, however, it is much inferior in efficacy.

Chemical Composition.—Mucilage *extractive,* resin, volatile oil, and a large proportion of woody fibre.

Dose of the powder, twelve to thirty grains.

* Barton's Collections, part I. p. 36.

CARYOPHYLLI. *A. L.* CARYOPHYLLI AROMATICI. *E. D.*

The Clove-tree. The Flower-buds. Essential Oil.

The Eugenia Caryophyllata is a beautiful tall tree, a native of the Molucca Islands. The Dutch, from the desire of monopolizing the valuable spice produced by it, destroyed all the trees except in Amboyna, where it is carefully cultivated. But their scheme has been frustrated, and the clove is now thriving in the Isle of France and other places. Every part of this tree is highly aromatic, but especially the leaf-stalk. Cloves are the flower-buds, which are gathered in October and November, before they open, and when they are still green, which are exposed to smoke for some days, and then dried in the sun.

Cloves have somewhat the form of a nail, consisting of a globular head, formed of the four petals of the corolla, and four leaves of the calyx not yet expanded; but this part is often wanting, being easily broken off; and a germen situated below, nearly round, but somewhat narrower towards the bottom; scarcely an inch in length, and covered with another thicker calyx, divided above into four parts. Their colour should be of a deep brown; their smell strong, peculiar, and grateful; their taste acrid, aromatic, and permanent. The best cloves are also large, heavy, brittle, and when pressed with the nail, exude a little oil. When light, soft, wrinkled, dirty, pale, and without smell or taste, they are to be rejected.

The Dutch, from whom we had this spice, frequently mix it with cloves from which the oil has been distilled. These, though in time they regain from the others a considerable share both of taste and smell, are easily distinguishable by their weaker flavour and lighter colour.

Cloves yield by distillation with water about one-seventh of their weight of volatile oil; 960 parts also gave to Neumann 380 of a nauseous, somewhat astringent, watery extract. The same quantity gave only 300 of excessively fiery alcoholic extract. When the alcoholic extract is freed from the volatile oil by distillation with water, the oil that arises proves mild, and the resin that remains, insipid. Its pungency therefore seems to depend on the combination of these principles. The Dutch oil of cloves is extremely hot and fiery, and of a reddish brown colour, but it is greatly adulterated, both with fixed oils and resin of cloves; for the genuine oil, when recently distilled, is comparatively quite mild and colourless, although it gradually acquires a yellow colour. It is heavier than water, and rises in distillation with some difficulty, so that it is proper to use a very low-headed still, and to return the distilled water several times upon the residuum.

Vauquelin obtained from the leaves of the *agathophyllum ravensara*, an essential oil in every respect similar to that of cloves.

Medical use.—Cloves, considered as a medicine, are very hot stimulating aromatics, and possess, in an eminent degree, the general virtues of substances of this class.

CAROTA. *A.* (*Secondary.*)

DAUCUS CAROTA. *E. L. D. Carrot. The Seeds.*

This is a biennial plant, which grows wild in Britain, and is cultivated in great quantities as an article of food. The seeds, especially of the wild variety, have a moderately warm pungent taste, and an agreeable aromatic smell. They are carminative, and are said to be diuretic. The roots, especially of the cultivated variety, contain much mucilaginous and saccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to carcinomatous and ill-conditioned ulcers, allaying the pain, checking the suppuration and fetid smell, and softening the callous edges.

CASSIA.

Willd. g. 813. *Decandria Monogynia.* Nat. ord. *Lomentaceæ.*

CASSIA FISTULA. *A. E. D. L.*

Purging Cassia. The Pulp of the Pods.

This tree is indigenous in India and Egypt, and is cultivated in Jamaica. It rises to about thirty feet high, and has long flower spikes, with yellow papilionaceous blossoms.

Its fruit is a cylindrical pod, a foot or more in length, and scarcely an inch in diameter: the outside is a hard brown bark; the inside is divided by thin transverse woody plates, covered with a soft black pulp, of a sweetish taste, with some degree of acrimony. There are two sorts of this drug in the shops; one brought from the East Indies, the other from the West, (Cassia Javanica ?) the canes or pods of the latter are generally large, rough, thick-rined, and the pulp nauseous; those of the former are less, smoother, the pulp blacker, and of a sweeter taste; this sort is preferred to the other. Such pods should be chosen as are weighty, new, and do not make a rattling noise (from the seeds being loose within them) when shaken. The pulp should be of a bright, shining, black colour, and have a sweet taste, neither harsh, which happens from the fruit being gathered before it has grown fully ripe, nor sourish, which it is apt to become upon keeping; not at all mouldy, which, from its being kept in damp cellars, or moistened, in order to increase its weight, it is very subject to be. Greatest part of the pulp dissolves both in water and in alcohol; and may be extracted from the pod by either. The shops employ water, boiling the bruised pod therein, and afterwards evaporating the solution to a due consistence.

Vauquelin has analyzed this pulp, and found to it consist of parenchyma, gluten, gelatin, gum, extractive, and sugar.

Medical use.—The pulp of cassia, from its saccharine and extractive constituents, is a gentle laxative medicine, and is frequently given, in a dose of some drachms, in costive habits. Some direct a dose of two ounces or more as a cathartic, in inflammatory cases, where the more acrid purgatives are improper; but in these large quantities it generally excites nausea, produces flatulences, and sometimes gripings of the bowels, especially if the cassia be not of a very good kind: these effects may be prevented by the addition of aromatics, and by exhibiting it in a liquid form.

CASSIA SENNA. *E. L. D.* SENNA. *A.*

Senna. The Leaves.

This species of cassia is annual, although in its mode of growth it resembles a shrub, and sends out hollow wooden stems, to the height of four feet. It grows principally in Upper Egypt, from whence the leaves are brought, dried, and picked from the stalks, to Alexandria in Egypt, and thence imported into Europe. They are of an oblong figure, sharp-pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively, yellowish green colour, a faint, not very disagreeable smell, and a sub-acrid, bitterish, nauseous taste. Some inferior sorts are brought from other places. These may easily be distinguished by their being either narrower, longer, and sharper pointed, from Mocha; or larger, broader, and round pointed, with small prominent veins, from Italy; or larger and obtuse, of a fresh green colour, without any yellow cast, from Tripoli.

It has been customary to reject the pedicles of the leaves of senna, as causing gripes and pains in the bowels; but this is a mere prejudice, for both leaves and pedicles act in the very same way. Neumann from 480 parts of senna got 143 alcoholic extract, and afterwards 140 watery; and inversely, 245 watery, and only 28 alcoholic, so that it seems to consist chiefly of mucilage and extractive.

Medical use.—Senna is a very useful cathartic, operating mildly and yet effectually; and, judiciously dosed and managed, rarely occasions the ill consequences which too frequently follow the exhibition of the stronger purges. The only inconveniences complained of in this drug are, its being apt to gripe, and its nauseous flavour.

These are best obviated by adding to the senna some aromatic substance, as ginger, cinnamon, &c., and by facilitating its operation by drinking plentifully of any mild diluent.

Senna may be given in substance to the extent of about a drachm, but it is rather too bulky, and it is therefore better to divide it into two doses, and to take the one half at night, and the other in the morning. It is more conveniently given in the form of infusion, which is generally made by pouring about six ounces of boiling water upon from two to six drachms of senna leaves in a tea-pot, and letting it stand about an hour. Senna ought never to be order-

ed in decoction, Gren says, because it becomes perfectly inert from the total dissipation of the nauseous and volatile principle on which its purgative effects depend; (questionable.) The tincture, on account of the menstruum, cannot be given in doses large enough to purge.

I have found the griping effects of this medicine prevented by giving it in combination with a strong solution of extract of liquorice.

Professor Bigelow has made an observation of some importance in relation to this article, viz. that there is no doubt that the true Alexandrian senna is the product of the cassia senna of Linnæus and Willdenow; and that Lamarck has occasioned unnecessary confusion on this subject, and misled botanists by changing the Linnæan name Cassia *Senna*, to Cassia *Lanceolata*, whilst he has appropriated the name Cassia Senna to the variety β of Linnæus, which is the Italian senna, and since named Cassia Italica.

The greater part of senna employed in the United States, comes from the East Indies.

It is certainly desirable that this valuable purgative should be domesticated amongst us; there can be very little doubt that it would succeed in the south. The seeds might readily be obtained through the medium of our merchant vessels. The East India senna seems to be less adulterated than that of Alexandria or Tripoli.

The merchants of Cairo mix the leaves of the senna imported from Alexandria, with those of *cynanchum oleafolium* and *colutea arborescens*. The former are distinguished by their greater length, as well as by their structure, which differs from the leaves of senna, in having a straight side, and being regular at their base, and in not displaying any lateral nerves on the under disk; the latter are so different from senna leaves, that there is no difficulty in at once recognizing them. The *Tripoli* senna contains a much larger proportion of *cynanchum*, &c. As a general rule, those leaves which appear bright, fresh, free from stalks and spots, that are well and strongly scented, smooth and soft to the touch, thoroughly dry, sharp-pointed, bitterish, and somewhat nauseous, are to be preferred.

Under the head of Senna, in Gray's Supplement to the Pharmacopœia, we have the following information.

"Alexandria Senna, Choice Senna.

"Made up by the merchants of Cairo, of five hundred weight of the leaves of cassia lanceolata, three hundred weight of those of cassia senna, and two hundred weight of those of cynanchum arguel.

"Tripoli Senna, Common Senna.

"Contains a larger proportion of cynanchum arguel, as also various proportions of periploca græca, and different species of apocynum."

For particular information on the subject of Senna, the reader is referred to the observations of M. Nectoux. *Voyage dans la haute*

Egypta, au dessus des Cataractes; avec des observations sur les diverses especes de Séné, qui sont repandues dans le Commerce. Paris, 1800.

CASSIA MARILANDICA. *A.*

American Senna. The Leaves.

The National Pharmacopœia directs the *plant* to be taken, which implies of course the stem, stalks, leaves, &c. It is apprehended that this was not strictly intended.

This tall and beautiful plant, though distinguished by the name of *Marilandica,* is by no means limited to that state; it is found from New-England to Carolina, and westward to the banks of the Missouri. It is an herbaceous perennial plant, four or five feet in height, flowering in July and August.

This plant is related to the preceding, (the Cassia Senna,) both in botanical habit and medical powers. It seems, however, to be generally admitted, that the Cassia Marilandica is considerably inferior in strength to the other, which is sufficient to prevent its entirely superseding it.

LAURUS CASSIA. *A. E. L. D.*

Cassia Tree. The Bark and Flower-buds gathered before they open.

This tree is very similar to that of the Laurus Cinnamomum. The bark, which is imported from different parts of the East Indies and from China, has a very exact resemblance to the cinnamon. It is distinguishable from the cinnamon, by being of a thicker and coarser appearance, and by its breaking short and smooth, while the cinnamon breaks fibrous and shivery.

It resembles cinnamon still more exactly in its aromatic flavour and pungency than in its external appearance, and seems only to differ from it in being considerably weaker, and in abounding more with a mucilaginous matter.

Cassia buds are the flower-buds which are gathered and dried before they expand. They have the appearance of a nail, consisting of a round head, about the size of a pepper-corn, surrounded with the imperfect hexangular corolla, which gradually terminates in a point. They have a brown colour, and the smell and taste of cinnamon.

Medical use.—Both the bark and buds of cassia possess the same properties with cinnamon, though in an inferior degree.

The bark is very frequently, and sometimes unintentionally, substituted for the more expensive cinnamon; and the products obtained from cassia bark and buds by distillation, are in no respect inferior to those prepared from cinnamon.

CARTHAMUS. *A.* (*Secondary.*)

Dyer's Saffron. The Flowers.

Upon what presumed efficacy the Convention have recommended, even in their secondary list, this article, would be difficult to say. Certain it is, that all the British Colleges have united in discarding it from their catalogues. Its virtues may be learned from old Dispensatories.

CASTANEA. *A.* (*Secondary.*)

Chinquapin. The Bark.

It is equally difficult to explain the introduction of the present article.

CASTOREUM. *A. E. L. D.*

Castor. The substance collected in the follicles near the anus of the Beaver.

Although sanctioned by the authority of the European Colleges, we candidly confess our scepticism as to the alleged virtues of this medicine; and should have rejoiced to have seen it omitted in our national list. If articles of medicine are to be chosen from their powerful odour, certainly we possess one superior to musk, to castor, and to the whole catalogue of antispasmodics. I mean the polecat or skunk. Why its virtues have never been commemorated amongst our indigenous productions, I much wonder!

We may say with respect to all these productions of the animal kingdom, that they are not more established in character, than hundreds in former time, which have now sunk into oblivion. It is scarcely a century, since the pharmacopœias embraced from twenty to thirty different varieties of fæces! from that of man, to the mouse and weazel; not to mention the *Album Græcum*, which still holds a place in some foreign countries. Why should not these and many more maintain their standing, if the castor, and musk, &c. secreted fluids hardened by age, &c. deserve the high encomiums bestowed upon them? Consider the contents of the alimentary canal, and we shall have an idea of the probable powers of the fæcal matters. A mixture of saliva, of gastric, pancreatic, and hepatic secretions, &c., of exhalations from the arteries, &c., and the offal remnants of the animal and vegetable food taken in. To this, from changes en-

suing in the affinities of some of the principles united thus together, we have an odour, which, if less agreeable, is fully as powerful as that of either musk or castor; and, in medicinal efficacy, I am persuaded would be vastly superior. That of man, or some preparation of it, was formerly supposed to "cure the ague, inflamed wounds, and the quinsie; sore eyes, baldness, corroding ulcers, and fistulas; the stone and gravel, bitings of mad dogs, and other venemous beasts; it helped dropsies, and was very effectual in the cure of epilepsy. An oil distilled from it, cured scald heads, gout, cancer, mortifications, erysipelas, jaundice, &c.;" and the *occidental civet*, which bore a character equal or superior to that of musk, we are told *was made* thereof, "*being nothing but the true essence of man's dung.*" But enough of this, *de gustibus non disputandum.* All that is meant by these observations is not to recommend the re-introduction of those nauseous remedies, but to endeavour to persuade the good sense of practitioners to *reject the few* which are still left. Whatever is said of castor, musk, &c. has been equally affirmed of hundreds of other articles, now extinct from the lists of medicines, and nothing but the extravagant prices of those mentioned, keep them still in use. *Unconnected* with the stimulants, &c. cotemporaneously employed, I suspect few practitioners would be content to depend upon them; and what benefit they may occasionally produce, are in cases in which probably assafœtida, &c. would be equally availing. If, nevertheless, we must continue in the routine of our predecessors, let us add to the list of animal secretions, that of the pole-cat; which, at least in the country, may be obtained at *less expense* and *more readily* than the costly articles of foreign origin.

With respect to the particular article to be considered here, the castor, we proceed to observe: That the *beaver* is strongly characterized by its flat, horizontal, scaly tail. It is an amphibious animal, and is found in the northern parts of Europe, Asia, and America, on the banks of lakes and rivers. In inhabited countries it is a solitary slothful animal, but in desert regions it lives in society; the remarkable manners of which, and the immense works effected by the united labours of all the individuals of their republic, have rendered the natural history of this animal familiar to every one. In both sexes, between the anus and pudendum, there are four follicles of an oblong shape, smaller above and larger below, formed of a tough membrane, almost resembling leather. The two largest and undermost of these, which are also connected, and lie parallel and close to each other, contain an oily fluid secretion, which is the substance known by the name of castor. It is preserved by cutting out the entire bags, and drying them in the smoke.

The best castor comes from Russia, Prussia, and Poland. The cods should be dry, gibbous, roundish, heavy, solid, and filled with a solid substance, contained in membranous cells, somewhat tough, but brittle, of a dark brown colour, of a peculiar, disagreeable, narcotic smell, and a nauseous, bitter, acrid taste. The Canadian castor is of an inferior quality; the cods are smaller, thin, oblong, and much corrugated, and the castor itself has much less smell and

taste: what is very old, quite black, and almost destitute of smell and taste, is unfit for use, as well as the counterfeited castor, which is a mixture of various gummy resins and other substances, with a little real castor, artificially interspersed with membranes, and stuffed into the scrotum of a goat. This imposition is easily detected by the weaker degree of its smell and taste, by chemical analysis, and even by mere external examination; for to the real bags, the two smaller and upper follicles, filled with a fatty matter, are always attached.

Neumann got from 480 parts of castor, 140 alcoholic extract, and afterwards 80 watery; inversely, 140 watery, and 20 alcoholic. The first alcoholic extract retained the whole flavour of the castor, as none of it rose in distillation with the alcohol. The distilled water, on the contrary, contained the whole flavour, and the watery extract was merely bitter. Cartheuser obtained from it a volatile oil by distillation. Bouillon Lagrange says it is composed of a resin, adipocere, volatile oil, and extractive, and Langier has discovered benzoic acid in it.

Borm, of Amsterdam, analyzed fresh castor, and found it to consist of one-third volatile oil, one half adipocere, and a little resin; one-sixth of membrane, and one-fourth of carbonat of lime. It lost by drying, forty per cent. The essential oil seems, therefore, to be either dissipated by drying, or converted into resin by absorbing oxygen.

Medical use.—Castor is said to be an excellent antispasmodic. It is very little heating, and acts peculiarly upon the uterine system.

It is given,

1. In typhoid fevers.
2. In spasmodic diseases, especially in hysteria and epilepsy, and in cases of difficult parturition, from a spasmodic contraction of the mouth of the uterus after the membranes have burst.
3. In amenorrhœa.

It is exhibited most advantageously in the form of powder, in doses of from 10 to 20 grains, and in clysters to a drachm. Diluted alcohol extracts its virtues; therefore it may be also given in the form of tincture. But its exhibition in the form of extract or decoction is improper.

CATAPLASMATA.—*CATAPLASMS.*

By cataplasms are in general understood those external applications which are brought to a due consistence or form for being properly applied, not by means of oily or fatty matters, but by water or watery fluids. Of these many are had recourse to in actual prac-

tice; but they are seldom prepared in the shops of the apothecaries; and in some of the best modern pharmacopœias no formula of this kind is introduced. The London and Dublin Colleges, however, although they have abridged the number of cataplasms, still retain a few; and it is not without some advantage that there are fixed forms for the preparation of them.

Cataplasma Fermenti. *L.* *Yeast Cataplasm.*

Take of
  Flour, ... one pound;
  Beer yeast, ... half a pint.
Mix and expose to a gentle heat, till the mass begins to swell.

The yeast excites fermentation in the flour, and converts the whole into a thin dough. This cataplasm is considered as a very efficacious application to putrid or putrescent ulcers or tumours. Sometimes some charcoal powder is added to this preparation, in order to obviate the fœtor.

Cataplasma Sinapeos. *D.* *Mustard Cataplasm.*

Take of
  Mustard seed, powdered,
  Crumb of bread, of each, . . . half a pound;
  Vinegar, ... as much as is sufficient.
Mix and make a cataplasm.

Cataplasms of this kind are commonly known by the name of *Sinapisms*. They were formerly frequently prepared in a more complicated state, containing garlic, black soap, and other similar articles; but the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as stimulants: they often inflame the part and raise blisters, but not so perfectly as cantharides. They are frequently applied to the soles of the feet in the low state of acute diseases, for raising the pulse and relieving the head. The chief advantage they have depends on the suddenness of their action.*

Sinapisms may be made stronger, by adding two ounces of scraped horse-radish.

* On this quickness of action a very important end in practice may be attained, and which I have repeatedly pursued with the best effect, viz. to apply a mustard cataplasm (in pleurisy, &c.) for an hour, or less, when the disposition to vesication is so strongly excited, that an epispastic will rise in half its usual time, which in many cases is of the utmost consequence.

CENTAUREA BENEDICTA. *E. D.*

Blessed Thistle. Leaves or Plant.

This is an annual plant, indigenous in the Grecian islands, and cultivated in gardens: it flowers in June and July, and perfects its seeds in the autumn. The herb should be gathered when in flower, quickly dried, and kept in a very dry airy place, to prevent its rotting or growing mouldy, which it is very apt to do. The leaves have a penetrating bitter taste, not very strong or very durable, accompanied with an ungrateful flavour, from which they are in a great measure freed by keeping. Water extracts, in a little time, even without heat, the lighter and more grateful parts of this plant; if the digestion be continued for some hours, the disagreeable parts are taken up. A strong decoction is very nauseous and offensive to the stomach. Rectified spirit gains a very pleasant bitter taste, which remains uninjured in the extract.

Neumann got from 1920 parts 270 alcoholic, and afterwards 390 watery extract, and inversely 600 watery and 60 alcoholic.

Medical use.—The virtues of this plant seem to be little known in the present practice. The nauseous decoction is sometimes used to provoke vomiting; and a strong infusion to promote the operation of other emetics. But this elegant bitter, when freed from the offensive parts of the herb, may be advantageously applied to other purposes. Excellent effects have been frequently experienced from a slight infusion of carduus in loss of appetite, where the stomach was injured by irregularities. A stronger infusion made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

The extract, prepared by evaporating the expressed juice, with the addition of a little alcohol to prevent it from becoming mouldy, has been strongly recommended in the catarrh of children.

The seeds of this plant are also considerably bitter, and have been sometimes used with the same intention as the leaves.

CERA.—*WAX.*

Wax is a solid, of considerable consistence, granulated and crystalline in its fracture, of a white colour, and without any remarkable odour or taste. It softens and becomes plastic when very slightly heated; at 140° it melts; at a higher temperature it is in part vaporized and decomposed, and its vapour is inflammable. It resists in a remarkable degree the action of the acids; but in most of its other properties it resembles the fixed oils. From its combustion it appears to consist of carbon 53.12, hydrogen 16.91, and oxygen 29.97; or, according to the former calculation, of 82.28 charcoal, and 17.72 hydrogen.

CERA FLAVA ET ALBA. *A. E. L. D.*

Wax—Yellow and White.

For this useful substance we are indebted to the common honey bee (*apis mellifica*), an insect belonging to the class of *Hymenoptera mellita* of Cuvier. It is, however, a vegetable production, and is collected by the bees from the surface of leaves, and the antheræ of flowers. They employ it to form the combs in which the honey and larvæ are deposited.

It is found in the shops in round cakes, which are formed by melting the combs in hot water, after all the honey has been expressed from them. The wax swims above, and the impurities either sink to the bottom, or are dissolved in the water. When recent, it is tenacious, but brittle, of a yellow colour, and sweet honey-like smell; dry, not greasy to the feel; insoluble in water, alcohol and ether; soluble in the fat oils and alkalies; fusible and inflammable. In selecting it, we should observe that the cakes be brittle, have a pleasant yellow colour, an agreeable smell, no taste, do not adhere to the teeth when chewed, and burn entirely away. When adulterated with resin, the fraud is detected by its taste, and the action of alcohol, which dissolves the resin. When mixed with pease meal, or earthy substances, it is more brittle, of a paler colour, and may be separated from them by liquefaction and straining. When combined with tallow, it becomes less brittle, but at the same time softer, and has an unpleasant smell.

Cera Flava Purificata. *D.* *Purified Yellow Wax.*

Take of

Yellow wax, any quantity.

Melt it with a moderate heat, remove the scum, and after allowing it to settle, pour it cautiously off from the fæces.

Yellow wax is so often adulterated, that this process is by no means unnecessary.

Cera Alba. *White Wax.*

The yellow colour of beeswax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process for bleaching wax, we, therefore, extend its surface as much as possible, by melting it and forming it into thin plates, which are fully exposed to the sun's rays, upon linen stretched in frames, and repeatedly moistened, until it acquires the whiteness desired. It is then usually melted into thin disks. White wax is more brittle, less fusible, and heavier than yellow wax. It is sometimes mixed with white oxyd of lead, or with tallow. For medical use, it has no advantage over yellow wax.

Medical use.—When taken internally, wax agrees in its effects with the fat oils, and though less frequently prescribed in this way, it is preferable, it being less apt to become rancid. Poerner recommends it as an excellent remedy in diseases of the intestines, attended with pain, excoriation, and obstinate diarrhœa. He gave a scruple, or half a drachm of wax, three or four times a day, in the form of an emulsion, by melting it first with some fixed oil, and then mixing it with a decoction of groats by tritnration with the yolk of an egg. But by far its principal use is for the formation of cerates, ointments, plasters, &c.

CEREVISIÆ FERMENTUM. *A. L. E. Yeast. Barm.*

Barm or yeast has lately been much extolled as an antiseptic remedy in putrid fevers. A table spoonful is recommended to be given as a dose, in porter, or wine and water. It is also applied externally, in the form of a poultice, to foul and putrid sores.

CERVUS ELAPHUS. *E. D. L. Stag or Hart. The Horns.*

CORNU CERVI. *A.*

The male has two round solid horns on his forehead, with several conical branches, the number of which ascertain the age of the animal to which they belong. These horns fall off and are renewed every year. When first reproduced, they are soft, full of bloodvessels, and covered with a velvety skin, but they soon lose their covering, and become hard, compact and bony.

In their nature they do not seem to differ from bone except in containing a larger proportion of cartilage. They afford a very considerable quantity of gelatin by decoction with water, and hartshorn shavings are still employed in domestic economy for furnishing a nutritious and demulcent jelly. By the action of fire, their products are the same with those of animal substances in general; and they were formerly so much used for the preparation of ammonia, that it was commonly called salt or spirit of Hartshorn. By burning they are totally converted into phosphat of lime.

PHOSPHAS CALCIS. *A.* *Phosphat of Lime.*

CORNU USTUM. *L.* *Burnt Horn.*

PULVIS CORNU CERVINI USTI. *D.* *Burnt Hartshorn.*

Burn pieces of hartshorn till they become perfectly white; then reduce them to a very fine powder.

The pieces of horn generally employed in this operation, are those left after distillation.

In the burning of hartshorn, a sufficient fire and the free admission of air are necessary. The potter's furnace was formerly directed for the sake of convenience; but any common furnace or stove will do. Indeed too violent a heat makes their surface undergo a kind of fusion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole less soluble. If the pieces of horn be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to whiteness, still retaining their original form.

According to the analysis of Merat Guillot, hartshorn was found to consist of 27. gelatin, 57.5 phosphat of lime, 1. carbonat of lime, and there was a loss of 14.5 probably water. Now, as the gelatin is destroyed by burning, and the water expelled, the substance which remains is phosphat of lime, mixed with less than two *per cent.* of carbonat of lime. Fourcroy and Vauquelin have analyzed bones more accurately, and found that they contain phosphat of magnesia, iron, and manganese; and that human bones contain less of the first of these, and more of the two others than animal bones, which is probably owing to the constant excretion of phosphat of magnesia in human urine. In human bones there are also traces of alumine and silex.

Medical use.—From its white earthy appearance, it was formerly considered as an absorbent earth. But since it has been accurately analyzed, that idea has been laid aside, and its use has been suggested as a remedy in rickets, a disease in which the deficiency of the natural deposition of phosphat of lime in the bones seems to be the essential or at least most striking symptom. M. Bonhomme, therefore, gave it to the extent of half a scruple, mixed with phosphat of soda, in several cases with apparent success. Whatever objections may be made to his theory, the practice certainly deserves a trial.

CHENOPODIUM. *A.*

CHENOPODIUM ANTHELMINTICUM. *Worm Seed. Jerusalem Oak.*

This plant grows plentifully in the United States, and is much used for worms. The whole plant has a powerful smell, of which it

is very retentive. Its taste is bitter, with much aromatic acrimony. The whole plant may be employed. The expressed juice is used, in doses of a table-spoonful for a child of two or three years old. A decoction of the plant made by boiling a handful of the green leaves in a quart of milk, for about one quarter of an hour, to which orange peel may be added, may be given to a child of four or five years old, in doses of about a wine-glassful two or three times a day. The seeds are more employed, reduced to a fine powder, and made into an electuary with syrup. Of this, a child of two or three years old may take a table-spoonful early in the morning; abstaining from nourishment for some hours: a like dose is given at night, or they may be strewed on bread and butter. It is often necessary to continue this course for several days. Great numbers of lumbrici are frequently discharged after the use of a few doses of the medicine. Barton's Collections, Part I. p. 38, 60.—Dr. Mease mentions the essential oil of the seeds as being equally or more powerful. Its dose is from four to eight or ten drops rubbed up with sugar. Medical Museum, vol. II.—For a more particular account, see Dr. Wilkins' statement, in a paper in the fifth volume of the Medical Museum.

Chironia Centaureum. *E. L. D.* Centaureum Minus.

Smaller Centaury. The flowering Heads.

This plant is annual, and grows wild in many parts of England on barren pastures. It flowers between June and August. The corolla is said to have no taste; and therefore the herb, which is intensely bitter, should be preferred to the flowering tops, which derive their virtues only from the stalks connected with them. It agrees in every respect with our pure bitters.

Neumann got from 480 parts, 210 alcoholic, and 140 watery extract; and inversely, 320 watery, 40 alcoholic.

Chironia Angularis. Sabbatia Angularis. *A.*

American Centaury. The Plant.

As this plant wants the most distinguishing characters of chironia, with which it has heretofore been associated, it has been referred with propriety to the genus *Sabbatia* of Adanson.

It is a beautiful annual plant, abundant in many parts of the United States. Every part of it is a pure and strong bitter, which property is communicated alike to alcohol and to water. It is devoid of astringency. It is an useful tonic and promoter of digestion, and has been employed in yellow, intermittent and remittent fevers.

CIMICIFUGA. *A.* (*Secondary.*) *Black Snake Root. The Root.*

CIMICIFUGA SERPENTARIA. *Pursh.*

I should apprehend this plant to be of inferior medicinal powers, whatever these may be, since it is placed in the secondary list; nor is it mentioned in the Medical Botany of either Professors Bigelow or Barton. Nuttall has no species of the above name under the generic head of Cimicifuga.

CINCHONA.—*PERUVIAN BARK.*

1. **CINCHONA PALLIDA.** *A. Pale Bark.*

CINCHONA LANCIFOLIA. *L. E.* CORTEX PERUVIANUS. *D.*

Lance-leaved Cinchona Bark. Common quilled Bark.

2. **CINCHONA RUBRA.** *A. Red Bark.*

CINCHONA OBLONGIFOLIA. *L. E. Oblong-leaved Cinchona Bark.*

3. **CINCHONA FLAVA.** *A. Yellow Bark.*

CINCHONA CORDIFOLIA. *L. E. Heart-leaved Cinchona.*

Notwithstanding the labours of the Spanish Botanists, the history of this important genus is still involved in considerable perplexity, and owing to the mixture of the barks of several species,* and their importation into Europe under one common name, it is extremely difficult to reconcile the contradictory opinions which exist upon the subject, nor indeed would such an investigation be consistent with the plan and objects of this work. Under the trivial name *officinalis,* Linnæus confounded no less than four distinct species of cinchona, and under the same denomination the British Pharmacopœias, for a long period, placed as varieties the three barks known in the shops; this error indeed is still maintained in the Dublin Pharmacopœia, but the London and Edinburgh Colleges have at length adopted the arrangement of Mutis, a celebrated botanist, who has resided in South America, and held the official situation of Director of the exportation of bark for nearly forty years.

* There are no less than twenty-five distinct species of cinchona, independent of any additions which we may owe to the zeal of Humboldt and Bonpland; and Mr. A. T. Thomson, in his London Dispensatory, states that in a large collection of dried specimens, of the genus cinchona, in his possession, collected in 1805, both near Loxa and Santa Fé, he finds many species which are not mentioned in the works of any Spanish botanist.

Cinchonæ Cordifoliæ* Cortex. *L. E.* Cortex Peruvianus. *D.* Heart-leaved Cinchona bark, commonly called *Yellow* bark.

Cinchonæ Lancifoliæ Cortex. *L. E.* Cortex Peruvianus. *D.* Lance-leaved Cinchona bark, common *Quilled* bark.—*Pale* bark.

Cinchonæ Oblongifoliæ Cortex. *L. E.* Cortex Peruvianus. *D.* Oblong-leaved Cinchona bark, called *Red* bark.

Qualities. The *odour* and *taste* of these three species are essentially the same, although they differ in intensity. They are all bitter, sub-astringent and aromatic, but the flavour of the *Yellow* bark is incomparably the most bitter, although less austere and astringent, whilst the red bark has a taste much less bitter, but more austere and nauseous than either of the other species.

Chemical Composition. No vegetable substance has been more frequently, or more ably submitted to analysis, and an attempt has even been made by Vauquelin to establish a classification upon the different effects which reagents produce upon the different kinds of bark; but the intermixture of the barks, as they occur in commerce, throws insuperable obstacles in all our researches, and we are compelled to rest satisfied with general results. The following may be stated as the known constituents of cinchona. Cinchonin, (a peculiar vegetable principle discovered by Dr. Maton, and characterized by its power of producing a precipitate with the infusion of nut galls,) resin, extractive, gluten, tannin, a small portion of volatile oil, and some salts whose base is lime, one of which is found only in *yellow* bark, and has been discovered to contain a peculiar vegetable acid, which Vauquelin denominated *kinic*, but which Dr. Duncan more properly calls *cinchonic* acid. In the *red* bark, Fourcroy detected also a portion of citric acid, some muriat of ammonia, and muriat of lime. Upon which of these principles the tonic and febrifuge virtues of bark depend, has not been satisfactorily explained. Deschamps attributes them to cinchonat of lime, and asserts that two doses of thirty-six grains each will cure any intermittent.† Westring considers tannin as the active constituent, whilst M. Seguin assigns all its virtues to the principle which precipitates tannin, and which he mistook for gelatin. Fabroni, however, concludes from his experiments that the febrifuge property does not belong essentially and individually to the astringent, the bitter, or any other soluble principle, since the quantity of these increases by protracted ebullition, whilst the virtues of the decoction evidently decrease. This argument, however, will not go far, when we learn that by long boiling, important chemical changes are produced in the liquid. In the midst of these difficulties, experience interposes

* Mr. A. Thompson regards this as the species which yields the common *pale* bark of the shops, and states, upon the authority of Mutis and Zea, that the Cinchona *Lancifolia* yields the *Yellow* bark.

† Essential Salt of Bark. The preparation sold under this empirical title, is an extract prepared by macerating the bruised substance of bark in cold water, and submitting the infusion to a very slow evaporation.

its aid, and demonstrates that the virtues of bark must depend upon the combination of all its principles, for no preparation, however carefully made or scientifically combined, will equal, in efficacy, bark in the state of powder; even the ligneous fibre, which the chemist pronounces to be inert and useless, may produce its share of benefit, by modifying the solubility of the ingredients, or by performing some mechanical duty which we are at present unable to appreciate.

Solubility. Cold water extracts its bitter taste, with some share of its odour; when assisted by a moderate heat, the infusion is stronger, but becomes turbid as it cools; the infusion cannot be kept, even for a short time, without undergoing decomposition, and being spoiled; wine also extracts the virtues of bark, and it is prevented by this substance from becoming sour, a fact which probably depends upon the avidity with which bark combines with oxygen, and which seems to throw some light upon the cause of its antiseptic virtues. The colouring matter of wine is precipitated by bark, as it is by charcoal in the course of a few days. By decoction the active matter of cinchona is in a great degree extracted, but if the process be protracted beyond eight or ten minutes, it undergoes a very important chemical change; it combines with oxygen, becomes insoluble, and medicinally considered, it is rendered inert; on this account, the extract is necessarily a very inefficient preparation; if we attempt to redissolve it, not more than one half is soluble in water. Vinegar is a less powerful solvent than water; the active matter of bark is rendered more soluble by the addition of mineral acids, and by the earths and alkalies, these latter bodies deepen its colour; *lime water* has been recommended as a solvent, and it affords an excellent form for children and dyspeptic patients; for the same reason we obtain, it is said, a stronger and perhaps a more efficient preparation, by triturating it with magnesia, previous to the process of infusion. Alcohol is a very powerful solvent, but the great activity of this menstruum so limits its dose, that we are prevented from exhibiting a sufficient quantity of the bark in the form of tincture; it furnishes, however, an excellent adjunct to other preparations.

Incompatible Substances. Precipitates are produced by *the salts of iron, sulphat of zinc, nitrat of silver, corrosive sublimate, tartarized antimony, solutions of arsenic, &c.* Any considerable portion of a tincture produces also a precipitation, which sometimes does not immediately take place, and the medicinal value of the bark is probably not impaired by it. As the infusions of *nut-galls* and some other vegetable astringents precipitate the cinchonin from bark, it becomes a question how far such liquids are medicinally compatible; saline additions, as *alum, muriat of ammonia, &c.* have been frequently proposed, but in many of such mixtures decompositions arise, which must deceive us with regard to the expected effects.

Forms of Exhibition. No form is so efficient as that of powder, but where the stomach rejects it, it must be administered in *infusion* or *decoction*, with the addition of its *tincture.* In cases where it is necessary to join cordials, an infusion of bark in Port wine is

a popular and very useful form for its administration.* Dose of the powder, gr. v. to ʒij. or more, of the infusion or decoction f℥ij.

Medical uses. It is powerfully tonic and antiseptic; it was introduced into practice for curing intermittent fevers, but since that period, it has been generally used in diseases of debility, in fevers of the typhoid type, and in gangrene. It was first conjectured to be useful in gout, by Sydenham, and Dr. Haygarth has strongly recommended its exhibition in acute rheumatism; when however it is used in these diseases, the greatest attention ought to be paid to the state of the bowels, and purgatives should be occasionally interposed. In dyspepsia, the use of the purer bitters is to be greatly preferred to that of the bark.

Adulterations. The frauds committed under this head are most extensive; it is not only mixed with inferior barks, but frequently with genuine bark, the active constituents of which have been entirely extracted by decoction with water. In selecting cinchona bark, the following precautions may be useful; it should be dense, heavy and dry, not musty, nor spoiled by moisture; a decoction made of it should have a reddish colour when warm; but when cold, it should become paler, and deposite a brownish red sediment. When the bark is of a dark *colour* between red and yellow, it is either of a bad species, or it has not been well preserved. Its *taste* should be bitter, with a slight acidity, but not nauseous, nor very astringent; when chewed, it should not appear in threads, nor of much length; the *odour* is not very strong, but when bark has been well cured, it is always perceptible, and the stronger it is, provided it be pleasant, the better may the bark be considered. In order to give bark the form of *quill*, the bark gatherers not unfrequently call in the aid of artificial heat, by which its virtues are deteriorated; the fraud is detected by the colour being much darker, and upon splitting the bark, by the inside exhibiting stripes of a whitish sickly hue. In the form of powder, in Great Britain, it is said, cinchona is always more or less adulterated. During a late official inspection of the shops of apothecaries and druggists, the censors repeatedly met with powdered cinchona having a harsh metallic taste, quite foreign to that which characterizes good bark. Much has been said of late concerning the probability of the genuine species of the cinchona tree becoming extinct; in consequence of which some succedaneum has been anxiously sought for; the bark of the broad-leaved willow, *Salix Caprea*, has been proposed for this purpose. Vogel recommends the root of *Geum urbanum avens*; others propose that of the *Datisca canabina*.

The *Cinchona Caribœa* of the Edinburgh Pharmacopœia is said by Dr. Wright, to whom we are indebted for our knowledge of it, to have satisfactorily answered in all cases where the Peruvian bark was indicated.

M. Ré, Professor of the Materia Medica at the Veterinary School at Turin, has announced that the *Lycopus Europæus* of Linnæus,

* It was under this form that the celebrated empiric Talbot, used to administer it in the paroxysms of Intermittents, and so successful was his practice, that Louis XIV. was induced to purchase at a large price the secret of his specific.

called by the peasants of Piedmont, the *Herb China*, is a complete succedaneum for Peruvian bark.—*Paris' Pharmacologia.*

In the Philadelphia Journal of the Medical and Physical Sciences, No. 4, we have an account of two new alkalies, *Cinchonine* and *Kinine*, discovered in Peruvian bark, by Pelletier and Caventon; the former, existing in the *pale*, the latter in the *yellow* bark, whilst *both* of them were simultaneously present in the *red* bark, and in greater amount; hence the presumed superiority of the red, over the other varieties. The particulars respecting these alkalies are detailed, as well as the process for procuring them.

Singular effect of Peruvian Bark.

A French merchant, at Guayra, named Delpech, in 1806, had occasion to receive several travellers, inhabitants of those countries. The apartments destined for visitors being filled, and the number of his guests increasing, he was under the necessity of putting several of them in rooms occupied by *cinchona.* Each of them contained from 8 to 10 thousand pounds of that bark. One of his guests was ill of a very malignant fever. After the first day he found himself much better, though he had taken no medicine; but he was surrounded with an atmosphere of cinchona, which appeared very agreeable to him. In a few days he felt himself quite recovered without any medical treatment whatever. This unexpected success, led M. Delpech to make some other trials. Several persons, ill of fever, were placed successively in his magazine of cinchona, and they were all speedily cured, simply by the effluvia of the bark.

In the same place with the cinchona, he kept a bale of coffee, and some bottles of common French brandy. In some time M. Delpech, when visiting his magazine, observed one of the large bottles uncorked. He suspected at first the fidelity of a servant, and determined to examine the quality of the brandy. What was his astonishment to find it infinitely superior to what it had been!—A slightly aromatic taste, added to its strength, and rendered it more tonic and more agreeable. Curious to know if the coffee had likewise changed its properties, he opened the bale, and roasted a portion of it. It was more bitter, and left in the mouth a taste similar to that of the effluvia of bark.—The bark which produced these singular effects was fresh. Would the cinchona of commerce have the same efficacy?

Cinchona Caribæa. *E. Caribœan Cinchona. The Bark.*

This tree is found in the Caribæan islands. It grows to a very large size. Dr. Wright, to whom we are indebted for all our knowledge of it, found some in the parish of St. James's, Jamaica, fifty feet high, and proportionally thick. The wood is hard, clouded, and takes a fine polish. The bark of the large trees is rough, the cuticle thick and inert, and the inner bark thinner than that of the young trees, but more fibrous. The bark is brought to us in pieces about a span in length, rolled together, and a line or half a line in thickness,

of a brown colour on the surface, which is most commonly covered with white lichens: internally it is of a dark brown colour, and very fibrous in its fracture. It has at first a sweetish taste, but after being chewed some time, it becomes extremely nauseous and bitter. Dr. Wright says he made use of this bark in all cases where Peruvian bark was indicated, and with the greatest success. It has often been confounded with the cinchona floribunda (Willdenow's seventh species,) so excellently analyzed by Fourcroy, under the title of the Cinchona of St. Domingo, and which, taken internally, is apt to excite vomiting and purging.

CINNAMOMUM. *A.* Laurus Cinnamomum. *E. L. D.*

The (inner) Bark, and its essential Oil.

This valuable tree is a native of Ceylon, where it was guarded with unremitting jealousy by the Dutch, that they might monopolize the commerce of its productions. They failed, however, in the attempt; and cinnamon trees are found, not only in other parts of the East Indies, but also in Jamaica, and other islands of the West Indies. Ceylon now belongs to the British, and Captain Percival has published a very interesting account of the cinnamon tree. It is found in greatest perfection in the immediate neighbourhood of Columbo, and grows from four to ten feet high, very bushy. The leaves resemble those of the laurel, and have the hot taste and smell of cloves when chewed. The blossom is white and very abundant, but diffuses no odour. The fruit resembles an acorn, and a species of fixed oil is obtained from it. There are several different species of cinnamon trees, or trees resembling them, in Ceylon, but four only are barked by government; the honey cinnamon, the snake cinnamon, the camphor cinnamon, which is inferior to these, and yields camphor from its roots, and mixed with gum from incisions made into it, and the *cabatte* cinnamon, which is harsher and more astringent than the others. The bark is collected at two seasons; the grand harvest lasts from April to August, the little harvest is in December. Such branches as are three years old are lopped off, the epidermis is then scraped off, the bark slit up, loosened and removed entire, so as to form a tube open at one side. The smaller of these are inserted within the larger, and they are spread out to dry. They are then packed up in bundles. The tasting of these bundles to ascertain their quality is a very disagreeable duty imposed on the surgeons, as it excoriates the tongue and mouth, and causes such intolerable pain as renders it impossible for them to continue the preparations two or three days successively. In their turns, however, they are obliged to resume it, and they attempt to mitigate the pain by occasionally eating a piece of bread and butter. It is then made up into large bundles about four feet long, and eighty pounds in weight. In

stowing the bales on ship-board, the interstices are filled up with black pepper, which is supposed to improve both spices.

The best cinnamon is rather pliable, and ought not much to exceed stout writing paper in thickness. It is of a light yellowish colour; it possesses a sweet taste, not so hot as to occasion pain, and not succeeded by any after-taste. The inferior kind is distinguished by being thicker, of a darker and brownish colour, hot, pungent when chewed, and succeeded by a disagreeable bitter after-taste. The Dutch were accused of deteriorating their cinnamon by mixing it with a proportion of real cinnamon, but which had been deprived of its essential oil by distillation. This fraud could only be detected by the weaker smell and taste. It is also often mixed with cassia bark. This last is easily distinguishable by its breaking over smooth, and by its slimy mucilaginous taste, without any thing of the roughness of the true cinnamon.

By distillation with water, it furnishes a small quantity of very pungent and fragrant oil, the water itself remains long milky, and has a strong flavour of cinnamon. The watery extract in Neumann's experiment amounted to 720 from 7680 parts. With alcohol the oil does not rise in distillation, but remains in the extract, which amounts to 960.

The essential oil of cinnamon has a whitish yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should sink in water, and be entirely soluble in alcohol. It is principally prepared in Ceylon.

Medical use.—Cinnamon is a very elegant and useful aromatic, more grateful both to the palate and stomach than most other substances of this class. Like other aromatics, the effects of cinnamon are stimulating, heating, stomachic, carminative and tonic; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach and in syncope; or as a stimulant in paralysis of the tongue, or to deaden the nerve in toothach. But it is principally used as an aromatic, to cover the less agreeable taste of other drugs.

Citrus Aurantium. *E. L. D. Seville Orange.*

The leaves, flowers, distilled water and essential oil of the flowers, the juice and outer rind of the fruit, and the unripe fruit.

AURANTII CORTEX. *A. Orange Peel.*

The orange tree is a beautiful evergreen, a native of Asia, but now abundantly cultivated in the southern parts of Europe and in the West India islands. There are several varieties of this species, but they may all be referred to the bitter or Seville orange, and the sweet or China orange.

The leaves are neither so aromatic nor so bitter as the rind of the fruit.

The flowers (*flores naphæ,*) are highly odoriferous, and have been for some time past in great esteem as a perfume ; their taste is somewhat warm, accompanied with a degree of bitterness. They yield their flavour by infusion to rectified spirit, and in distillation both to spirit and water, (*aqua florum naphæ*): the bitter matter is dissolved by water, and, on evaporating the decoction, remains entire in the extract.

A very fragrant red-coloured oil, distilled from these flowers, is brought from Italy under the name of *oleum* or *essentia neroli;* but oil of behen, in which orange flowers have been digested, is frequently substituted for it. The fraud, however, is easily detected, as the real oil is entirely volatile, and the adulterated is not.

The juice of oranges is a grateful acid liquor, consisting principally of citric acid, syrup, extractive, and mucilage.

The outer yellow rind of the fruit is a grateful aromatic bitter.

The unripe fruit dried are called Curacoa oranges. They vary in size from that of a pea to that of a cherry. They are bitterer than the rind of ripe oranges, but not so aromatic, and are used as a stomachic.

Medical use.—The leaves have been celebrated by eminent physicians as a powerful antispasmodic in convulsive disorders, and especially in epilepsy; with others they have entirely failed. Orange flowers were at one time said to be an useful remedy in convulsive and epileptic cases; but experience has not confirmed the virtues attributed to them. As by drying they lose their virtues, they may be preserved for this purpose by packing them closely in earthen vessels, with half their weight of muriat of soda. The juice is of considerable use in febrile or inflammatory distempers, for allaying heat, quenching thirst, and promoting the salutary excretions: it is likewise of use in genuine scorbutus, or sea-scurvy. Although the Seville, or *bitter orange,* as it is called, has alone a place in our pharmacopœias, yet the juice of the China, or sweet orange, is much more employed. It is more mild, and less acid; and it is used in its most simple state with great advantage, both as a cooling medicine, and as an useful antiseptic in fevers of the worst kinds, as well as in many other acute diseases, being highly beneficial as alleviating

thirst. Dr. Wright applied the roasted pulp of oranges as a poultice to fetid sores in the West-Indies, with very great success.

The rind proves an excellent stomachic and carminative, promoting appetite, warming the habit, and strengthening the tone of the viscera. Orange-peel appears to be considerably warmer than that of lemons, and to abound more with essential oil; to this circumstance, therefore, due regard ought to be had in the use of these medicines. The flavour of the first is likewise supposed to be less perishable than that of the latter.

Citrus Medica. *E. L. D.* Limon. *A.*

Lemon. The juice and outer rind of the fruit, and the volatile oil of the outer rind.

The juice of lemons is similar in quality to that of oranges, from which it differs little otherwise than in containing more citric acid and less syrup. The quantity of the former is indeed so great, that the acid has been named from this fruit, Acid of Lemons, and is commonly prepared from it. The simple expressed juice will not keep on account of the syrup, extractive, and mucilage, and quantity of water which it contains, which causes it to ferment.

The yellow peel is an elegant aromatic, and is frequently employed in stomachic tinctures and infusions: it is considerably less hot than orange-peel, and yields in distillation with water a less quantity of essential oil: its flavour is nevertheless more perishable, yet does not arise so readily with spirit of wine; for a spiritous extract made from lemon-peel possesses the aromatic taste and smell of the subject in much greater perfection than an extract prepared in the same manner from the peels of oranges.

Medical use.—Lemon Juice is a powerful and agreeable antiseptic. Its powers are much increased, according to Dr. Wright, by saturating it with muriat of soda, This mixture he recommends as possessing very great efficacy in dysentery, remittent fever, the belly-ach, putrid sore throat, and as being perfectly specific in diabetes and lienteria. Citric acid is often used with great success for allaying vomiting: with this intention it is mixed with carbonat of potass, from which it expels the carbonic acid with effervescence. This mixture should be drunk as soon as it is made: or the carbonic acid gas, on which actually the anti-emetic powers of this mixture depends, may be extricated in the stomach itself, by first swallowing the carbonat of potass dissolved in water, and drinking immediately afterwards the citric acid properly sweetened. The doses are about a scruple of the carbonat dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allaying febrile heat and thirst. Of these, the most generally useful is lemonade, or diluted

lemon juice, properly sweetened. Lemonade, with the addition of a certain quantity of any good ardent spirit, forms the well-known beverage punch, which is sometimes given as a cordial to the sick. The German writers order it to be made with arrack, as rum and brandy, they say, are apt to occasion headach. But the fact is directly the reverse, for, of all spirits, arrack is most apt to produce headach. The lightest and safest spirits are those which contain least essential oil, or other foreign matters, and which have been kept the longest time after their distillation.

ACIDUM CITRICUM. *A.* *Citric Acid.*

Take of

The juice of lemons, ... one pint;
Carbonat of lime prepared, . . . one ounce, or as much as may be sufficient to saturate the juice.
Diluted sulphuric acid, ... nine fluid ounces.

Add the carbonat of lime by small portions at a time to the juice, whilst boiling, and mix it by stirring; then pour off the liquor. Wash the citrat of lime which remains by repeated additions of fresh warm water, and then dry it. Add the diluted sulphuric acid to the dried powder, and boil it for ten minutes; then press it strongly through a linen cloth, and afterwards filter it through paper. Let the clear liquor which has passed be evaporated in a gentle heat, so that crystals may form as it gets cold.

To render these crystals pure, dissolve them a second and a third time in water, and after each solution filter the liquor, boil it down, and set it by to crystallize.

Citric acid crystallizes in rhomboidal prisms, which suffer no change from exposure to the air, and have an exceedingly acid taste. When sufficiently heated, they melt, swell, and emit fumes, and are partly sublimed unchanged, and partly decomposed. Water, at ordinary temperatures, dissolves half of its weight of these crystals, and at 212° twice its weight. The solution undergoes spontaneous decomposition very slowly. Sulphuric acid chars it, and forms vinegar. Nitric acid converts it into oxalic and acetic acids.

Citrats are decomposed by the stronger mineral acids, and also by the oxalic and tartaric, which form an insoluble precipitate in their solutions. The alkaline citrats are decomposed by a solution of barytes.

For very particular details respecting the manufacture of citric acid, the reader is referred to Parke's Chemistry applied to the Arts.

CLEMATIS CRISPA.—CLEMATIS VIORNA.

The leaves of these species of clematis are extremely acrid, and may be found useful in chronic rheumatism, palsy, old ulcers, and in fine, in all the diseases in which Stork found the clematis recta useful. It is necessary to use them in small doses.*

CLEOME DODECANDRA.

This plant is a native of Pennsylvania, New-York, &c. and grows abundantly in the neighbourhood of Albany. The whole plant has an extremely fetid smell. In some parts of the United States, the root is employed as an anthelmintic.†

COCCINELLA. *D.*

Coccus Cacti. *E. L.* *Cochineal.*

Cochineal is the dried body of the female of an hemipterous insect. It is found only in Mexico, chiefly in the province of Oaxaia, on the leaves of a non-descript cactus, according to Humboldt. There are two kinds of the cochineal insect, which live on different species of cactus. The wild cochineal, *grana sylvester,* which is covered with a silky or cottony envelope, and is found in many places, New-Granada, Quito, Peru, Mexico, is less valuable than the cultivated or powdery cochineal, which is without that covering, grows to a larger size, and furnishes a finer and more permanent colour. The Spaniards endeavour to confine both the insect and the plant on which it feeds, to Mexico. But this attempt at monopoly will, we hope, be frustrated, by the exertions of some gentlemen in the East Indies, whither the insect was carried from Rio Janeiro in 1795, by captain Nelson. The male only is furnished with wings; the female has none, and remains constantly attached to the leaf of the cactus. During the rainy season, the Mexicans preserve these insects, with the succulent leaves to which they are attached, in their houses; and after the rainy season is over they are transferred to the living plants, and in a few days they lay innumerable eggs, and die: Or the pregnant mothers are rapidly conveyed to the neighbouring mountains, where they are kept till October, when the rains cease in the plains and commence in the mountains. They are collected three times in the year; first, the dead mothers are gathered, as soon as they have laid their eggs, *grana de pastle:* in

* Barton's Collections, Part II. p. 30. † Barton's Collections, Part I. p. 64.

three or four months, the young, which have grown to sufficient size, are collected ; and in three or four months more, all the young are collected, large and small indiscriminately, except those which they preserve for breeding next year. They are killed by throwing them into hot water, or by turning them over in heaps in the sun, or by placing them on mats in their furnaces ; which last method, though least common, preserves upon the insect that whitish powder, which enhances their price at Vera Cruz and Cadiz. Good cochineal loses but two-thirds of its weight by being dried. From a very distant period, laws have existed against the adulteration of cochineal, and it is ordered to be exposed for sale in separate grains, not in agglutinated masses. 800,000 pounds are brought annually to Europe ; and each pound contains at least 70,000 insects ; Humboldt says, 32,000 arobas of 32 pounds each. From their appearance, when brought to us, they were long supposed to be the seed of some plant. They are small, irregular, roundish bodies, of a blackish red colour on the outside, and a bright purple red within. Their taste is acrid, bitterish, and astringent. They are used chiefly for the sake of the fine colour which they produce, and they are principally consumed by the scarlet dyers. It is worthy of notice, that not only the fruit, but even the green joints of several species of cactus, dye cotton purple or red. In pharmacy, they are employed to give a beautiful red to some tinctures. Their colour is easily extracted, both by alcohol, water, and water of ammonia ; and in the dried insect it is not impaired by keeping for any length of time.

" The true cochineal has been found in South Carolina, and Mr. Raphael Peale, of Philadelphia, asserts, that he has discovered it upon the island of Little St. Simons, on the coast of Georgia. It is extremely desirable that the insect, and the cactus coccinellifer plant on which it breeds, should be cultivated in the southern states. The planters might find it a valuable source of revenue, when, from vicissitudes in the season, their crops of rice or cotton should fail."

Neumann got from 1920 grains, 1440 watery extract ; and in another experiment, from the same quantity, 1430 alcoholic. The former was extremely gelatinous.

The peculiar colouring principle of cochineal has been called *cochenelin*. When perfectly pure, it is a very brilliant purple red powder, with a granular crystalline appearance. *Carmina* has been suggested as a better title. Cochineal is said to be invariably adulterated with pieces of dough, formed in moulds, and coloured with cochineal, and that this fraud gives employment to a considerable number of women and children in London. By throwing the suspected sample into water, the *spurious* ones are dissolved, and the extent of the adulteration is ascertained.

Medical use.—They have been lately recommended as an anodyne and antispasmodic in whooping cough.

In pharmacy they are used for colouring tinctures and lip-salve.

COCHLEARIA OFFICINALIS. *D.*

Common Scurvy-grass. The Plant.

This is an annual plant, which grows on the sea-shore of the northern countries of Europe, and is sometimes cultivated in gardens. As long as it is fresh it has a peculiar smell, especially when bruised, and a kind of saline acrid taste, which it loses completely by drying, but which it imparts by distillation to water or alcohol. It also furnishes an essential oil, the smell of which is extremely pungent.

Medical use.—The fresh plant is a gentle stimulant and diuretic, and is chiefly used for the cure of sea-scurvy. It is employed externally as a gargle in sore-throat, and scorbutic affections of the gums and mouth. It may be eaten in substance in any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation.

COCHLEARIA ARMORACIA. *E. L. D.* ARMORACIA. *A.*

Horse-radish. The Root.

The American Pharmacopœia directs the *plant* for use; we believe the *root* only is officinal elsewhere.

This perennial plant is sometimes found wild about river sides, and other moist places: for medicinal and culinary uses, it is cultivated in gardens; flowers in June, but rarely perfects its seeds in Great Britain. Horse-radish root has a quick pungent smell, and a penetrating acrid taste; it nevertheless contains in certain vessels a sweet juice, which sometimes exudes upon the surface. By drying, it loses all its acrimony, becoming at first sweetish, and afterwards almost insipid: if kept in a cool place, covered with sand, it retains its qualities for a considerable time.

According to Neumann, 3840 parts were reduced by drying to 1000, and gave of watery extract 480, and 15 of alcoholic, and inversely 420 alcoholic, and 480 watery; all these extracts were sweetish, without pungency. About fifteen of volatile oil, extremely pungent, and heavier than water, arose in distillation with water.

Medical use.—This root is an extremely penetrating stimulus. It excites the solids, and promotes the fluid secretions. It has frequently done service in some kinds of scurvies and other chronic disorders, proceeding from a viscidity of the juices, or obstructions of the excretory ducts. Sydenham recommends it likewise in dropsies, particularly those which sometimes follow intermittent fevers.

COFFEA.

The Coffee Tree. The Seed.

A shrub from twelve to eighteen feet high, originally a native of Arabia, but is now cultivated in the East and West Indies, and in several parts of America. The Arabian, or Mocha coffee, imported from the Levant, is far the most aromatic and resinous, and, on account of its superior flavour, is the most esteemed. Very various have been the opinions entertained by different physicians relative to the medicinal qualities of the coffee-berry; some inveighing against its use as a pernicious indulgence, others, on the contrary, are as vehement in its praise. It has been suspected of producing palsies; and Dr. Percival assures us, from his own observations, that the suspicion is not altogether without foundation. According, however, to the experiments, and in the language of the same respectable author, coffee is slightly astringent and antiseptic; it moderates alimentary fermentation, and is powerfully sedative. Its medicinal qualities seem to be derived from the grateful sensation it produces on the stomach, and from the sedative powers it exerts on the *vis vitæ*. Hence it assists digestion, and relieves the headach; but in delicate habits it often occasions watchfulness, tremors, and many of those complaints denominated nervous.

The celebrated Sir John Pringle, bestows high encomiums on coffee, as a remedy in paroxysms of the periodic asthma. He directs the best Mocha coffee, newly burnt, and made very strong immediately after grinding it, an ounce to one dish, without milk or sugar, to be repeated after the interval of a quarter or half an hour, until relief be obtained. We are assured also, that Sir John Floyer, during the latter years of his life, kept free from, or lived easy under this afflictive complaint, by the use of strong coffee.

With respect to the medicinal properties of coffee, says Dr. Willich, it is in general excitant and stimulating, though we doubt whether it relaxes the animal fibres, as has by some authors been supposed. Its more or less wholesome effect greatly depends on the climate, as well as the age, constitution, and other peculiarities of the individual. Hence it cannot be recommended to children, or persons of a hot, choleric, nervous, or phthisical habit; nor will it be so useful in warm, as in cold and temperate climates; but to the phlegmatic and sedentary, a cup of coffee, one or two hours after a meal, or, which is still better, one hour before it, may be of service to promote digestion, and prevent or remove a propensity to sleep. In cases of spasmodic asthma, hypochondriasis, scrofula, diarrhœa, agues, and particularly against narcotic poisons, such as opium, hemlock, &c. coffee often produces the best effects; nor is there a *domestic* remedy, better adapted to relieve periodical headachs which proceed from want of tone, or from debility of the stomach.

The heaviness, headach, giddiness, sickness, and nervous affec-

tions, which attack some persons in the morning, after taking an opiate at night, are abated by a cup or two of strong coffee.

Dr. Barton recommends a strong infusion of coffee, with or without sugar and milk, in cases of retention or suppression of the menses, accompanied with very weak arterial action. He opposes its use in all cases of active hemorrhagies, and even in common fluor albus, when connected with febrile action.

COCOS BUTYRACEA. *E.*

The Mackaw Tree. The fixed oil of the nut, called Palm Oil.

This tree is a native of South America. The fruit is triangular, yellow, and as big as a plumb. The nut or kernel yields the *oleum palmæ* of the shops. It is first slightly roasted and cleaned, and then ground to a paste, first in a mill, then on a levigating stone. This paste is gently heated, and mixed with $\frac{3}{16}$ its weight of boiling water, put into a bag, and the oil expressed between two heated plates of iron. It yields $\frac{7}{16}$ or $\frac{8}{16}$ of oil. If coloured, this oil may be purified by filtration when melted. This oil has the consistence of butter, a golden yellow colour, the smell of violets, and a sweetish taste. When well preserved, it keeps several years without becoming rancid. When spoiled, it loses its yellow colour and pleasant smell. It is said to be often imitated with axunge, coloured with turmeric, and scented with Florentine iris root. It is rarely used in medicine, and only externally as an emollient ointment.

It has of late been largely used in England, in the manufacture of *toilette soap.*

COLCHICUM. *A.*

Colchicum Autumnale. *E. L. D. Meadow Saffron. The Root.*

Willd. g. 707. *sp.* 1. *Smith, Flor. Brit. g.* 187. *sp.* 1. *Hexandria Trigynia.*—Nat. ord. *Liliaceæ.*

Although the *root* is here ordered, it is more properly the *bulb;* for a number of stringy fibres proceed from the bottom of this bulb, which constitute the roots, but are of no use in medicine.

Meadow Saffron is a perennial bulbous-rooted plant, which grows in wet meadows in the temperate countries of Europe. It flowers in the beginning of autumn, at which time the old bulb begins to decay, and a new bulb to be formed. In the following May the new bulb is perfected, and the old one wasted and corrugated. They are dug for medical use in the beginning of summer. The sensible

qualities of the fresh root are very various, according to the place of growth, and season of the year In autumn it is inert; in the beginning of summer highly acrid: some have found it to be a corrosive poison, others have eaten it in considerable quantity, without experiencing any effect. When it is possessed of acrimony, this is of the same nature with that of garlic, and is entirely destroyed by drying.

Medical use.—Storck, Collin, and Plenck have celebrated its virtues as a diuretic in hydrothorax and other dropsies. The expressed juice is used in Alsace to destroy vermin in the hair.

It has of late years been asserted, that colchicum forms the basis of Husson's *Eau Medicinale.* A saturated vinous tincture is now used as its substitute in gout, rheumatism, dropsy, &c. and apparently with equal effects. It acts irregularly, probably from the different periods at which it has been collected for use, and also from *other roots* having been sold for it, to those who are ignorant of its appearance. It generally combines an anodyne effect with a drastic operation as an emetic, purgative, or diuretic. At certain seasons, it seems absolutely inert. Orfila gave two or three bruised bulbs to dogs, without any bad effect. We seem yet to want more specific details as to its culture, and best time of collecting for medical use.

The seeds have lately been highly extolled. The plant does not appear to produce them in America; although in England they are abundant.

In the fifteenth volume of the London Medical Repository, is a paper by Mr. Williams, on the efficacy of colchicum seeds in syphilitic rheumatism; also a review of a work on the subject by Mr. Hayden, respecting its use in inflammatory diseases.

In the *London Medical and Physical Journal,* No. 254, we are informed that the month of July is the proper time to take it up; and some account is given of alcoholic tincture of guaiacum being a test of the goodness of colchicum.

In the fourteenth volume of the *London Medical Repository*, Mr. Battley gives particular information as to its growth, &c., with experiments on the subject, and his ideas as to the best mode of drying it. All these are at present but little known amongst us, and as the subject is highly interesting, I shall introduce them here.

By an analysis of the bulb of colchicum, Pelletier and Caventon find it to consist of fatty matter, composed of elaine, stearine, volatile acid; acid gallate of veratrine; yellow colouring matter; gum; starch; inuline* in abundance; woody substance. The ashes are in too minute a quantity to merit attention.

From this examination, it appears that the cedavilla, veratrum album, and colchicum, owe their properties, in great part, to a new alkali, called veratrine.

* The inuline appears to exist in the root of colchicum, in inseparable combination with starch.

Dr. Williams in a communication in the London Medical Repository, for June 1821, entitled "Further remarks upon the Seeds of the Colchicum Autumnale," &c.; recommends that their collection should depend rather upon their dark brown colour, than upon the *exact* season of the year, in order to obtain them in perfection. He ascertained that in a pound of the seeds gathered the latter part of

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An account of some experiments to prove the advantage of employing the alcoholic solutions of Guaiac, as a test of the goodness of the dried bulb of COLCHICUM AUTUMNALE; with some remarks on the best period for taking up the bulb, and the method of drying it, so as to preserve its medicinal properties unaltered. By Anthony Todd Thomson, F. L. S. &c.

Gluten is one of the constituents of the recent bulb of the colchicum, and Mr. T. found that those specimens of the root, in which gluten could be demonstrated, were the most efficacious; also he found, that the gluten of vegetables is easily destroyed by the application of heat; he was therefore led to infer, that the known inefficacy of certain specimens of colchicum was connected with the destruction of the gluten by drying, especially as he recollected, that a great change in the components of a vegetable body, necessarily takes place, when one of those components is destroyed. He therefore made experiments to prove his suspicions, and he found that no specimen of the bulb is to be depended on, which does not shew that the gluten in it remains unchanged, at least, if the root be gathered at the proper period.

The experiments are related, and they appear to prove the above observations. they consist in rubbing, perhaps ten grains of the dried bulb, with about sixteen minims of distilled vinegar, to dissolve the gluten, and then rubbing the two with an equal quantity of alcoholic solution of guaiac; a beautiful cœrulean blue colour immediately appears, if the specimen be a good one, which colour is permanent.

Mr. T. thinks he is authorized in concluding from them,

1st. That the diversity of opinions of practitioners, at the present time, regarding the medicinal powers of the bulb of the *colchicum autumnale*, proceeds from the different conditions in which it is found in the shops, and in which it is consequently administered.

2d. That the month of July is the best period for taking up the plant, as the bulb has then attained its full growth and perfection; whilst the vegetation of the germs or lateral progeny, for the support of which the bulb is intended, has scarcely commenced.

3d. That the bulb, when taken up, should, as soon as possible, be cut, as Mr. Battley directs, "into transverse slices," equal in thickness to half-a-crown; and these being spread out upon clean white paper, should be dried *without artificial heat*, in any airy situation, screened from sunshine.

4th. That the slices, when dried, should be nearly oval, but not notched, nor panduriform, friable, of a white or cream colour, somewhat granular on both surfaces, inodorous, bitter to the taste, and altogether free from sweetness; and should afford a fine cœrulean blue colour, when rubbed with a few drops of vinegar and the alcoholic solution of guaiac.

5th. That practitioners who compound their own prescriptions, should purchase the drug in the sliced state, and test it in the manner above described before employing it.

6th. That a physician, in prescribing the remedy, should endeavour to ascertain in what condition it is kept in the shop of the druggist who is to compound his prescription; and that the Royal College of Physicians should notify to the Apothecaries' Company, that, owing to the condition in which the dried colchicum is now sold in their Hall, it is not capable of effecting the object for which it is prescribed.

We have much pleasure in analysing this communication, for it is on a subject which is very interesting to us.—We have now for some years employed the colchicum, and seen it employed very extensively; and we have lately transmitted a paper for publication, which describes the outline of our experience of it as a medical agent of great activity and importance. As the subject, however, is now taken up, with much interest, by very many medical practitioners, we shall briefly say here, that an experience of more than six years has proved to us the great powers of the colchicum autumnale in controlling the action of the heart and arteries; so that it has become, in our hands, not only as useful in the cure of rheumatism and gout, as it has been in the practice of other people, but of almost equal efficacy in the treatment of nearly all the forms of inflammation, whether local or general—acute, or sub-acute; and of all such complaints arising from increased action of the heart and arteries, as we are accustomed

June or early in July, eleven ounces in weight were lost by drying; whilst the same quantity collected at the end of July or beginning of August, lost only two ounces and a half.

He also protests against *bruising* the seeds in their preparation as a medicine. Their value he states as residing chiefly in the husk, or cortical part; and he prefers Sherry wine to any other in the preparation; or what is preferable, *proof spirit*, in consequence of the very variable quality of the wine. His formula for the tincture, is two ounces apothecaries' weight of the unbruised seeds, macerated for ten days or a fortnight, in a fluid pint of proof spirit.

It appears that the demand for *colchicum seed*, has caused other seeds to be sold for them. In order to prevent mistake or imposi-

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to designate diseases of excitement. With such powers, it will not appear extraordinary, that it should have materially lessened the necessity for bleeding in our practice; and indeed we may add further, that we have often been able, through its means, *to put out*, as it were, inflammatory diseases, with more certainty and rapidity, than by any other remedial agent, the lancet excepted; whilst it possesses this great advantage over the lancet, that it leaves the strength of the patient nearly unimpaired, instead of occasioning a great loss of what may be called the vital fluid, which necessarily accompanies the use of the latter: or we may put it in other words, and say, that whilst the lancet only acts indirectly, and therefore leaves behind it one evil, whilst it removes another, the colchicum proves itself to be a real restorative; inasmuch as its action appears to be direct, and as if it merely re-established the lost equilibrium of the system, and restored the morbid actions, which are present in the constitution, to their healthy state. We have principally used it in the form of powder, because it has appeared to be, in that form, less liable to produce inconvenience, than in that of the wine or acetum, as usually employed. We have commonly too, robbed it further of its deleterious properties, by joining as much opening medicine with it as is sufficient to secure its purgative effect, before more than a certain quantity is taken; for we have found, that whilst the expected relief has often been obtained before any perceptible effect on the constitution has occurred, we have not found that relief to be less perfect, or more protracted, when the opening medicine is added, than when the colchicum is trusted to alone.

A Letter from Mr. Battley, on the best method of drying and preparing COLCHICUM BULBS.

This communication is in answer to one from Mr. Thomson; which we gave in our last number.

Mr. B. agrees with Mr. T. that the properties of plants are best preserved by drying them with the least disarrangement of their component parts; but he disagrees with the idea, that any degree of heat, beyond that of the atmosphere, is injurious in the drying of the colchicum bulbs. He uses a heat of 170°; and says, moreover, that Mr. T.'s account of the shape of the bulb in July, which is said, by the latter, to be the best time for gathering the plant, is incorrect; for, that the notch in the bulb, in which the offset afterwards lies, is found as certainly in July, before the offset appears, as in September, when it has shot above ground, and formed the flower.

With regard to the latter fact, Mr. B. says, that the notch was found in all of a hundred weight of *natural* bulbs, which were delivered to him before the first of August; whilst, we happen to know, that Mr. T.'s bulbs, gathered at the same time, showed no trace of the notch; but then, they were, we believe, grown in a garden.

Respecting the more important circumstance of, whether heat in drying injures the plant, future experiments must decide which of the two gentlemen is right: but we should be inclined to lean rather to the side of Mr. T.; because, we know, from some of his collateral experiments, that he took a very accurate method of testing the virtues of his preparations.

We may add, however, that we know, from very multiplied experience, that the bulbs, when dried at 130°, and even more, form an exceedingly powerful medicine: although it is very important that our ideas on the subject should be precise; and, therefore, we hope the question of, which is the best mode of drying the plant, so as to preserve its virtue the most effectually, will soon be settled.—*Medical Intelligencer*. vol. i. pp. 321. 366.

tion, the following description of the seeds is given by Mr. Gray in the London Medical Repository for April, 1821.

Semina Colchici Autumnalis.

Seeds, ovate, globose, about one-eighth of an inch in diameter.

Integuments, simple, soft, spongy, membranaceous, thin, dull reddish brown, closely adherent to the perisperm.

Perisperm, or *albumen*, hard, rather cartilaginous, pellucid, pale, not in the least divided, of the same shape as the seed.

Corculum, or *embryo*, very small, ovate, globose, not in the least divided, whitish, placed nearly opposite to the *hylum*, or that part where the seed is affixed to the parent plant, but out of the axis of the seed. Base pointing to the hylum, slender, apex very obtuse.

The *leaves* of the colchicum autumnale are stated to be a most destructive poison to cattle, producing first, a most violent purging, reducing them to excessive weakness; after which constipation ensued, not to be removed by the usual remedies; and the cattle died the following day, in great pain: the stomach was much inflamed, and the villous coat entirely destroyed. If this is the case, it is most probable that they would likewise prove very active articles of the Materia Medica.

Extracts from Practical Observations on Colchicum Autumnale, by Chas. Th. Haden, Esq. London, 1820, p. 72.

"His ordinary form of prescription is a powder, composed of one part of powdered colchicum, three of carbonat of potash, and five of sulphat of potash. Of this powder, one drachm is to be taken three or four times a day with half a pint of warm water, in the state of effervescence, with tartaric or citric acid. To this is sometimes added a dose of calomel at night; and, when the bowels are not freely moved before the second or third day, and the disease is violent, salts and senna to quicken its operation; but in very violent cases, more colchicum is required, whilst no more purgative medicine can be borne; and then, pills of colchicum only, are given between the doses of the powder, or, in other cases of violence, pills of calomel, and from five to eight or ten grains of colchicum are given in the first instance, to be followed by the powders, as directed above.

"In cases where bleeding is considered to be adviseable, it is made to precede the exhibition of colchicum. It will usually happen that the medicine will produce some relief on the second day; but not its decidedly beneficial operation till the third day, when purging generally takes place. In some cases, indeed, no relief occurs, even on the third day, when full doses of opening medicine are required, or it is necessary to increase the dose of colchicum, &c. &c.

"In children and weakly subjects, the dose of the powder, in all cases, varies from sixteen grains to two scruples; so as to give from two to five or six grains of the colchicum; the full drachm containing about seven grains."

He refers to the variation in strength of the article, according to

the period of the bulbs being collected, and the care with which they are dried.

"Mr. Thomson thinks he has proved, that the bulb is in its highest state of excellence in the month of July, or, at latest, early in August; and also, that drying the bulbs at a higher temperature than that of the atmosphere, materially tends to dissipate the apparently evanescent principle on which their efficacy depends. Mr. Battley has, however, published an answer to Mr. Thomson's paper in the Medical Repository for November, in which he advocates the advantage of drying the bulbs, after being sliced immediately on being gathered, at a temperature of 170° of Fahr.

"Both these accounts cannot be right; indeed, the subject is still entirely *sub judice.*" He adds, that "neither his father nor himself has found the different specimens which they have used, to vary very materially from each other in practice, although they have been gathered both in spring and in autumn, or have been purchased from different druggists," &c. "The powder he is at present using is more powerful than he has before used, and it was gathered about the middle of September, when the plants were in flower, and was dried at least at 130° of temperature, on the day it was gathered, having been first cut into thin slices, and spread out on perforated trays; it was powered on the day after."

"From eight pounds of fresh bulbs, Mr. Bainbridge obtained two pounds fifteen ounces of dried slices; and from them two pounds ten ounces and a quarter of fine powder, with four ounces of hard, brown, outside scales, which latter were very difficult to powder, and were not used."

Mr. Haden thinks the tincture by no means comparable in utility to the powder, yet he admits he had not used the former extensively.

Preparations of Colchicum, from Gray's Supplement to the Pharmacopœia.

VINUM RADICUM COLCHICI. *Wine of Colchicum.*

℞ Rad. colch. sicc. . . . ℥ij.
Vin. albi Hisp. . . . . ℔ij.
Infuse, filter, and add
Sp. vin. rect. . . . . . ℥ij.
Used in gout, twenty drops at night.

VINUM SEMINUM COLCHICI. *Wine of the Seeds of Colchicum.*

℞ Sem. colch. sicc. . . . ℥ij.
Vin. albi Hisp. . . . . ℔i.
Infuse for ten days, and filter.
One to three drachms, bis in die, in rheumatism.

EAU D' HUSSON. *Eau Medicinale.*

℞ Rad. colch. . . . . . ℥ij.
Vini albi Hisp. . . . ℥viij.

ACETUM COLCHICI. *Vinegar of Colchicum.*

℞ Rad. colchici, . . . ℥i.
Acet. distill. . . . . ℔i.
Digest for a day, and express—add
Proof spirit, ... ℥i.
Diuretic, half a drachm to a drachm, bis in die.

OXYMEL COLCHICI. *Oxymel of Colchicum.*

℞ Fresh roots of colchicum, . . . ℥i.
Distilled vinegar, ... ℔i.
Soak for two days and press—to the liquor add
Honey, ... ℔ij.
And boil to a syrup.
In asthma and dropsy, one drachm bis in die, gradually increased.

TINCTURA COLCHICI. *Tincture of Colchicum.*

Want's Eau d'Husson.

℞ Rad. colchici, . . . ℥ij.
Proof spirit, ... ℥iv.
Used in gout.

COLOMBA. *A. E.* COLOMBO. *D.* CALUMBA. *L.*

Colomba. The Root.

This is the root of an unknown plant, which, however, is conjectured by Willdenow to be a species of bryonia. It was supposed to have its name from a city in Ceylon, from which it is sent over all India. But more recent accounts say, that it is produced in Africa, in the country of the Caffres, and that it forms an important article of commerce with the Portuguese at Mozambique, in the province of Tranquebar. It is generally brought in transverse sections, from half an inch to three inches in diameter, rarely divided horizontally. This is evidently done to facilitate its drying, for the large pieces are all perforated with holes. The bark is wrinkled and thick, of a dark brown colour on the outside, and bright yellow within. The pith in the centre is spongy, yellowish, and slightly striped. Its smell is slightly aromatic, and readily lost when not preserved in close vessels; its taste is unpleasant, bitter, and somewhat acrid; the bark has the strongest taste; the pith is almost mucilaginous. Its essential constituents are cinchonin, and a great deal of mucilage. It is accordingly more soluble in water than in alcohol. The tincture is not precipitated by water, and does not affect the colour of infusion of turnsole, or solution of red sulphat of iron. Planche says it contains one-fourth of its weight of starch.

In the garden at Madras a plant of it has been raised from the root, which has as yet only produced male flowers; its genus therefore has not been ascertained, but it appears to belong to the natural order of *Monospermæ.* (See Dr. Berry's account of it, together with an engraving, in Asiatic Researches, vol. x. 385.)

Medical use.—In India it is much used in diseases attended with bilious symptoms, particularly in cholera; and it is said to be sometimes very effectual in other cases of vomiting. It often produces excellent effects in dyspepsia. Half a drachm of the powder is given repeatedly in the day.

CONFECTIONES.—*CONFECTIONS. A.*

Including Conserves, Electuaries, and Confections of former Pharmacopœias.

We confess we prefer the name of electuaries to the others, which seem to remind us more of a confectioner's shop than of a *drug store.*

Confectiones. Conservæ. Electuaria.

Conserves are compositions of recent vegetable matters and sugar, beaten together into a uniform mass.

This process is introduced for preserving certain simples, undried, in an agreeable form, with as little alteration as possible in their native virtues; and in some cases it is very advantageous. Vegetables, whose virtues are lost or destroyed in drying, may in this form be kept uninjured for a considerable time: by carefully securing the mouth of the containing vessel, the alteration, as well as dissipation of their active principles, is generally prevented; and the sugar preserves them from the corruption which juicy vegetables would otherwise undergo.

The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. Rose buds, and some other vegetables, are prepared for mixing with sugar by a small wooden mill contrived for that purpose.

There are, however, vegetables whose virtues are impaired by this treatment. Mucilaginous substances, by long lying with sugar, become less glutinous; and astringents sensibly become softer upon the palate. Many of the fragrant flowers are of so tender and delicate a texture, as almost entirely to lose their peculiar qualities on being beaten or bruised.

In general, it is obvious, that in this form, on account of the large admixture of sugar, only substances of considerable activity can be taken with advantage as medicines. And, indeed, conserves are at present considered chiefly as auxiliaries to medicines of greater effi-

cacy, or as intermedia for joining them together. They are very convenient for reducing into boluses or pills the more ponderous powders, as sub-muriat of mercury, the oxyds of iron, and other mineral preparations; which, with liquid or less consistent matters, as syrups, will not cohere.

The shops were formerly encumbered with many conserves altogether insignificant; the few now retained have in general either an agreeable flavour to recommend them, or are capable of answering some useful purposes as medicines. Their common dose is the bulk of a nutmeg, or as much as can be taken up at once or twice upon the point of a knife. There is, in general, no great danger of exceeding in this particular.

Electuaries and Confections are composed chiefly of powders mixed up with syrups, &c. into such a consistence, that the powders may not separate in keeping, that a dose may be easily taken up on the point of a knife, and not prove too stiff to swallow.

Electuaries are composed chiefly of the milder alterative medicines, and such as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like, (except in officinal electuaries to be dispensed by weight,) are seldom trusted in this form, on account of the uncertainty of the dose: disgustful ones, acrids, bitters, fetids, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous substances, as mercurials, these being apt to subside on keeping, unless the composition be made very stiff.

The lighter powders require thrice their weight of honey, or syrup boiled to the thickness of honey, to make them into the consistence of an electuary: of syrups of the common consistence, twice the weight of the powder is sufficient.

Where the common syrups are employed, it is necessary to add likewise a little conserve, to prevent the compound from candying and drying too soon. Electuaries of Peruvian bark, for instance, made up with syrup alone, will often in a day or two grow too dry for taking. This is owing to the crystallization of the sugar. Deyeux, therefore, advises electuaries, confections, and conserves, to be made up with syrups from which all the crystallizable parts have been separated. For this purpose, after being sufficiently evaporated, they are to be exposed to the heat of a stove as long as they form any crystals. The syrup which remains, probably from the presence of some vegetable acid, has no tendency to crystallize, and is to be decanted and evaporated to a proper consistence. In hospital practice, the same object may be obtained much more easily by using molasses instead of syrups.

The quantity of an electuary, directed at a time, in extemporaneous prescription, varies much according to its constituent parts, but is rarely less than the size of a nutmeg, or more than two or three ounces.

CONFECTIO AROMATICA. *A. L.*

ELECTUARIUM AROMATICUM. *E. D.*

Aromatic Confection or Electuary.

Take of
Cassia bark,
Cardamom,
Ginger, of each, ... once ounce;
Reduce them to very fine powder, and add
Syrup of orange peel, . . six fluid ounces.
Mix, and beat them well together.

The Edinburgh College order a precisely similar preparation, only that they employ *at once* one part of the *aromatic powder* to two parts of syrup of orange peel. Now this aromatic powder is made with the three first ingredients of the above formula, in the same proportions. The United States' Pharmacopœia has also the same aromatic powder, as an officinal preparation; why it was necessary to have it *officinal,* and to prepare it extemporaneously for making the above confection, is not explained; certainly one alone would have been sufficient!

Its effects are cordial, and it is given in form of a bolus, from five to twenty grains. It is sometimes used as a vehicle for more active substances.

CONFECTIO AURANTII CORTICIS. *A.*

CONFECTIO AURANTIORUM. *L.* CONSERVA (CITRI, *E.*) AURANTII. *D.*

Conserve, or Confection of Orange Peel.

Take of
Fresh orange peel, . . . one part;
Sugar, ... three parts.
Bruise the peel to a pulp, gradually adding the sugar during the beating.

CONFECTIO CASSIÆ. *A. L.*

ELECTUARIUM CASSIÆ. *E. D.* *Electuary, or Confection of Cassia.*

Take of
Purging cassia, ... four parts;
Tamarind, the pulp,
Manna, of each, ... one part;
Syrup of orange peel, . . four parts.
Having beat the manna in a mortar, dissolve it with a gentle heat in the syrup; then add the pulps, and evaporate with a regularly continued heat to a proper consistence.

This composition is a very convenient officinal, to serve as a basis for purgative electuaries and other similar purposes. The tamarinds give it a pleasant taste, and do not subject it, as might be expected, to turn sour. After standing for four months, the composition has been found no sourer than when first made. This electuary, likewise, is usefully taken by itself, to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

CONFECTIO ROSÆ. *A. D.* Confectio Rosæ Gallicæ. *E. L.*

Confection or Conserve of (red) Roses.

Take of
  Roses, any quantity.
Beat them to a pulp; and add, during the beating, three times their weight of sugar.

The three Colleges recommend the *Rosa Gallica.* Our Pharmacopœia employs the damask. We presume, that for any real medicinal virtues, either of them is equally efficient.

La Grange says, that by infusing the red rose leaves in four times their weight of water, and squeezing them out of the infusion, they lose their bitterness, and are more easily reduced to a pulp, which he then mixes with a thick syrup, prepared by dissolving the sugar in the expressed liquor, and boiling it down to the consistence of an electuary.

CONFECTIO SCAMMONIÆ. *A. L.*

Electuarium Scammonii. *D.* *Confection (Electuary) of Scammony.*

Take of
  Scammony,
  Ginger, of each in powder, . . . one ounce;
  Oil of cloves, ... one scruple;*
  Syrup of orange peel, ... what is sufficient.
Rub the dry articles together into a very fine powder; next rub them again while the syrup is gradually added; then add the oil of cloves, and mix the whole well together.

A warm, brisk purgative. One drachm and a half contains fifteen grains of scammony.

* What is meant in the National Pharmacopœia by *fluid* scruple in this place? Such a measure is not indicated in its table of weights and measures. Is a fluid scruple the technical translation for *minima viginti?*

CONFECTIO SENNÆ. *A. L.*

ELECTUARIUM SENNÆ. *D.* (COMPOSITUM. *E.*)

Confection or Electuary of Senna. Lenitive Electuary.

Take of
- Senna, ... eight ounces;
- Coriander, ... four ounces;
- Liquorice, bruised, . . three ounces;
- Figs, ... one pound;
- Prunes, (the pulp,) . . one pound;
- Tamarinds, ... half a pound;
- Sugar, ... two pounds and a half.

Pulverize the senna with the coriander, and sift out ten ounces of the mixed powder; boil the remainder with the figs and liquorice, in four pints of water, to one half; express and strain the liquor, which is then to be evaporated to about a pint and a half; dissolve the sugar in it, add this syrup by degrees to the pulps, and lastly mix in the sifted powder.

In this prescription, it will be seen, by comparing the Latin and English formulæ of the *Pharmacopœia*, that an error, probably typographical, exists in one of them. It is true, the articles are of *no consequence*, but it might have equally occurred in a more active ingredient. The error is in the English, (coriander seeds, three in place of four ounces; liquorice root, four in place of three ounces.)

This electuary is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits.

ELECTUARIUM CATECHU COMPOSITUM, OLIM CONFECTIO JAPONICA. *E.*

Compound Catechu Confection or Electuary.

Take of
- Extract of catechu, . . . four ounces;
- Kino, ... three ounces;
- Cinnamon,
- Nutmeg, each, ... one ounce;
- Opium, diffused in a sufficient quantity of Sherry wine, one drachm and a half;
- Syrup of red roses, boiled to the consistence of honey, two pounds and a quarter.

Reduce the solids to powder; and having mixed them with the opium and syrup, make them into an electuary.

This electuary is an extremely useful astringent medicine, and is often given in doses of a tea-spoonful, frequently repeated, in cases of diarrhœa, &c. Ten scruples contain one grain of opium.

Confectio Opii. *L.* Electuarium Opiatum. *E.*

Thebaic, or Opiate Electuary, or Confection.

Take of

Aromatic powder, ... six ounces;
Virginia snake root, in fine powder, . . three ounces;
Opium, diffused in a sufficient quantity of Sherry wine, half an ounce;
Syrup of ginger, ... one pound.

Mix them and form an electuary.

The action which this electuary will produce on the living system is abundantly apparent from the nature of the ingredients. They are combinations of aromatics with opium; one grain of opium being contained in forty-three of the Edinburgh electuary.

Confectio Amygdalarum. *L.* *Confection of Almonds.*

Take of

Sweet almonds, ... one ounce;
Gum Arabic, powdered, . . one drachm;
Refined sugar, ... half an ounce.

Having first blanched the almonds by macerating them in water and peeling them, beat the whole ingredients into a homogeneous mass.

By triturating this confection with water, we immediately form an almond emulsion, which on many occasions is desirable, as it takes a considerable time to make it from the unmixed materials, and soon spoils.

With respect to the class of medicines now under notice, it may be affirmed, the smaller the number, the more perfect the Pharmacopœia. This will be obvious, when it is considered that the means of their adulteration are so much facilitated. The Confectio Sennæ we are informed is frequently made in London, with jalap blackened with walnut liquor, instead of cassia; and the most of what is there sold, is little else than prunes, figs and jalap. It is likewise manufactured with unsound and spoiled apples, as the principal ingredient! We must regret that the whole body of confections, conserves and electuaries, had not been rejected in toto!

COLLYRIA.—*COLLYRIA.*

EYE WATERS.

Collyria are remedies appropriate to the eye, (derived from the words *κωλυω inhibeo,* and *ρευς fluxio,* quia fluxiones oculorum inhibit.

Blancard's Medical Lexicon.) The ancients used the term in the same sense, but they gave it a much greater latitude, denoting by it likewise, a composition of powders brought to a consistence by some liquid, and formed into something like a tent of various sizes, according to the cavities it was designed for. Thus Scribonius Largus orders a collyrium of the bigness of a pine kernel to be introduced into the anus. *See Celsus.* The collyria of our Pharmacopœia, may technically be denominated eye waters.

COLLYRIUM PLUMBI ACETATIS. *A.*

Collyrium of Acetat of Lead.

Take of
Acetat of lead, ... a scruple;
Distilled water, . . . half a pint.
Mix and dissolve.

COLLYRIUM PLUMBI ACETATIS ET OPII. *A.*

Collyrium of Opium and Acetat of Lead.

Take of
Acetat of lead, ... a scruple;
Distilled water, ... half a pint;
Tincture of opium, . . . a fluid drachm.
Mix.

It would seem superfluous to have this second formula as a standing article, when it may be seen to be nothing more than the first, with the addition of one drachm of laudanum, an addition better made extemporaneously.

COLLYRIUM ZINCI ACETATIS. *A.*

Collyrium of Acetat of Zinc.

Take of
Sulphat of zinc, . . . twelve grains;
Acetat of lead, . . . sixteen grains;
Distilled water, . . . half a pint.
Mix and dissolve, and after precipitation pour off the clear liquid.

We may say the same of this also; as we find a *precisely* similar formula for the preparation of *Acetat of Zinc;* and which is, indeed, a very elegant and useful article, which may may be made in any quantity, and never is injured by keeping. It requires only the addition of half a pint of water to about fifteen grains of the salt, and the above collyrium is instantly formed, without a precipitate, &c. This article is also advantageously used for other purposes, as injections, &c. which will be noticed elsewhere.

COLLYRIUM ZINCI SULPHATIS. *A.*

Collyrium of Sulphat of Zinc.

Take of
 Sulphat of zinc, . . . twelve grains;
 Distilled water, . . . half a pint.
Mix and dissolve.

This was scarcely deserving of a permanent location in the Pharmacopœia; indeed they all might better class as extemporaneous prescriptions, for their strength will have to vary perpetually in practice.

A much esteemed collyrium, used very largely and successfully by the late president of the College of Physicians, Dr. Redman, was the following:

℞ Vitriol alb.,
 Bol. Armon., . . . ā ℥ij.
 Camphoræ, ... ℥ss. M. Ft. pulv.

Cujus infuse ʒss in aq. rosar. ℥iv, vel in aq. pluviale. Ft. aq. ophthalmic.

COLOCYNTHIS. *A. D.* CUCUMIS COLOCYNTHIS. *E. L. D.*

Colocynth. Coloquintida. Bitter Apple, &c.

The Medullary part of the Fruit.

This is an annual plant of the gourd kind, a native of Turkey. The fruit is about the size of an orange; its medullary part, freed from the rind and seeds, is alone made use of in medicine; this is very light, white, spongy, composed of membranous leaves, of an extremely bitter, nauseous, acrimonious taste. It is gathered in autumn when it begins to turn yellow, and is then peeled and dried quickly, either in a stove or in the sun. In the latter case it should be covered with paper.

Neumann got from 7680 parts, 1680 alcoholic extract, and then 2160 watery; and inversely, 3600 watery and 224 alcoholic. The late analysis of this substance gives mucilage, resin, bitter extractive, and some gallic acid.

Medical use.—Colocynth is one of the most powerful and most violent cathartics. Many eminent physicians condemn it as dangerous, and even deleterious: others recommend it not only as an efficacious purgative, but likewise as an alterative in obstinate chronical disorders. This much is certain, that colocynth, in the dose of a few grains, acts with great vehemence, disorders the body, and

sometimes occasions a discharge of blood. Many attempts have been made to correct its virulence, by the addition of acids, astringents, and the like: these may lessen the force of the colocynth, but no otherwise than might be equally done by a reduction of the dose. The best method of abating its virulence, without diminishing its purgative virtue, seems to be by triturating it with gummy farinaceous substances, or the oily seeds.

Mixed with paste or other cements, it is used to keep away insects by its extreme bitterness.

The dose four to ten grains.

It is said that when the fruit is larger than a middle sized orange, and has *black* acute pointed seeds, it is not good.

CONIUM. *A.* Conium Maculatum. *E. L.* Cicuta. *D.*

Hemlock. The Leaf, Flower and Seed.

Pentandria Digynia.—Nat. ord. *Umbellatæ.*

This is a large biennial umbelliferous plant, which grows very commonly about the sides of fields, under hedges, and in moist shady places. As it may easily be confounded with other plants of the same natural order, which are either more virulent, or less active, we shall give a full description of its botanical characters. The root is white, long, of the thickness of a finger, contains when it is young a milky juice, and resembles both in size and form the carrot. In spring it is very poisonous, in harvest less so. The stalk is often three, four, and even six feet high, hollow, smooth, not beset with hairs, and marked with red or brown spots. The leaves are large, and have long and thick foot-stalks, which, at the lower end, assume the form of a groove, and surround the stem. From each side of the foot-stalk other foot-stalks arise, and from these a still smaller order, on which there are sessile, dark green, shining, lancet-shaped, notched leafits. The umbels are terminal and compound. The flowers consist of five white heart-shaped leaves. The seeds are flat on the one side, and hemispherical on the other, with five serrated ribs. This last circumstance, with the spots on the stalks, and the peculiar very nauseous smell of the plant, somewhat resembling the urine of a cat, serve to distinguish it from all other plants. We must not be misled by its officinal name Cicuta, to confound it with the Cicuta virosa of Linnæus, which is one of the most virulent plants produced in Great Britain, and readily distinguishable from the conium, by having its roots always immersed in water, which those of the conium never are. The possibility of this mistake shows the propriety of denominating all vegetables by their systematic names, as the Edinburgh college now do. The other plants which have been mistaken for the conium maculatum are, the

æthusa cynapium, caucalis anthriscus, and several species of chærophyllum, especially the bulbosum.

Hemlock should not be gathered unless its peculiar smell be strong. The leaves should be collected in the month of June, when the plant is in flower. The leafits are to be picked off, and the foot-stalks thrown away. The leafits are then to be dried quickly in a hot sun, or rather on tin plates before a fire, and preserved in bags of strong brown paper, or powdered and kept in close vessels, excluded from the light; for the light soon dissipates their green colour, and with it the virtues of the medicine.

Medical use.—Fresh hemlock contains not only the narcotic, but also the acrid principle; of the latter much, and of the former little, is lost by drying. The whole plant is a virulent poison, but varying very much in strength according to circumstances. When taken in an over-dose, it produces vertigo, dimness of sight, difficulty of speech, nausea, putrid eructations, anxiety, tremors, and paralysis of the limbs. But Dr. Storck found, that in small doses it may be taken with great safety; and that, without at all disordering the constitution, or even producing any sensible operation, it sometimes proves a powerful resolvent in many obstinate disorders. In scirrhus, the internal and external use of hemlock has been found useful, but then mercury has been generally used at the same time. In open cancer, it often abates the pains, and is free from the constipating effects of opium. It is likewise used in scrofulous tumours and ulcers, and in other ulcers that are only defined by the term ill-conditioned. It is also recommended by some in chincough, and various other diseases. Its most common, and best form, is that of the powdered leaves, in the dose at first of two or three grains a-day, which in some cases has been gradually increased to upwards of two ounces a day, without producing giddiness. An extract from the seeds is said to produce giddiness sooner than that from the leaves.

The medicinal activity of the plant resides in a resinous element, which may be obtained in an insulated form, by evaporating an ethereal tincture of the leaves, on the surface of water; it has a rich dark green colour, and contains the peculiar odour and taste of hemlock in perfection; a dose of half a grain will produce vertigo and head ache. It may be distinguished by the name of *conein.* The watery extract of this plant can therefore possess but little power, which fact, Orfila has fully established by experiment. Every part of the plant is active, but the leaves most so. Alcohol and ether extract its virtues; and vinegar is its best antidote.

CONTRAYERVA. *A.* (*Secondary.*)

DORSTENIA CONTRAYERVA. ***E. L.*** *Contrayerva.* ***The Root.***

This plant is perennial, and grows in South America, and some of the Caribæan islands.

The root is knotty, an inch or two long, and about half an inch thick, of a reddish brown colour externally, and pale within: long, rough, slender fibres shoot out from all sides of it; and are generally loaded with small round knots. It has a peculiar kind of aromatic smell, and a somewhat astringent, warm, bitterish taste, with a slight and sweetish kind of acrimony, when long chewed; the fibres have little taste or smell; the tuberous part, therefore, should be alone chosen.

This root contains so much mucilage, that a decoction of it will not pass through the filter. Neumann got from 480 parts, 190 watery extract, and afterwards with alcohol 7; and inversely, 102 alcoholic, and 60 watery. The tincture reddens infusion of litmus, is precipitated by water, and has no effect on the salts of iron.

Medical use.—Contrayerva is a gentle stimulant and diaphoretic, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm.

CONVOLVULUS SCAMMONIA. *E. L. D.* SCAMMONIUM. *A.*

Scammony. The Gum Resin.

The scammony convolvulus is a climbing perennial plant, which grows in Syria, Mysia, and Cappadocia. The roots, which are very long and thick, when fresh contain a milky juice. To obtain this, the earth is removed from the upper part of the roots, and the tops of these are cut obliquely off. The milky juice which flows out, is collected in a small vessel, sunk in the earth at the lower end of the cut. Each root furnishes only a few drachms, but it is collected from several vessels, and dried in the sun. This is the true and unadulterated scammony. It is light, of a dark grey colour, but becomes of a whitish yellow when touched with the wet finger, is shining in its fracture, has a peculiar nauseous smell, and bitter acrid taste, and forms with water a greenish milky fluid, without any remarkable sediment. In this state of purity it seldom reaches us, but is commonly mixed with the expressed juice of the root, and even of the stalks and leaves, and often with flour, sand or earth. The best to be met with in the shops comes from Aleppo in light spongy masses, having a heavy disagreeable smell, friable, and easily powdered, of a shining ash colour verging to black; when powdered, of a light grey or whitish colour. An inferior sort is brought from Smyrna in more compact ponderous pieces, with less smell, not so friable, and less easily powdered, of a darker colour, not so resinous, and full of sand and other impurities.

Resin is the principal constituent of scammony. Sixteen ounces of good Aleppo scammony give eleven ounces of resin, and three and a half of watery extract. Bouillon La Grange and Vogel ob-

tained from 100 parts, 60 of resin, 3 of gum, 2 of extract, and 35 of insoluble matter.

Medical use.—Scammony is an efficacious and strong purgative. Some have condemned it as unsafe, and laid various ill qualities to its charge; the principal of which is, that its operation is uncertain, a full dose proving sometimes ineffectual, whilst at others, a much smaller one occasions dangerous hypercatharsis. This difference, however, is owing entirely to the different circumstances of the patient, and not to any ill quality, or irregularity of operation, of the medicine: where the intestines are lined with an excessive load of mucus, the scammony passes through, without exerting itself upon them; where the natural mucus is deficient, a small dose of this or any other resinous cathartic irritates and inflames. Many have endeavoured to diminish the activity of this drug, and to correct its imaginary virulence, by exposing it to the fumes of sulphur, dissolving it in acids, and the like: but these only destroy a part of the medicine, without making any alteration in the rest. Scammony in substance, judiciously managed, stands not in need of any corrector: if triturated with sugar, or with almonds, it becomes sufficiently safe and mild in its operation. It may likewise be conveniently dissolved by trituration, in a strong decoction of liquorice, and then poured off from the feces. The common dose of scammony is from three to twelve grains.

Water by trituration takes up one-fourth, alcohol two-thirds, and proof spirit dissolves all but the impurities. A factitious scammony is sold in England, consisting of jalap, senna, manna, gamboge, and ivory black. Good scammony ought to be friable, and when wetted with the finger, should become milky. Its powder should manifest its peculiar odour, that of old ewe milk cheese.

Convolvulus Jalapa. *E. L. D.* Jalapa. *A.*

Ipomæa Macrorhiza. *Jalap. The Root.*

Jalap is another climbing perennial species of convolvulus. It is an inhabitant of Mexico and Vera Cruz. It is brought to us in thin transverse slices, which are covered with a blackish wrinkled bark, are of a dark grey colour internally, marked with darker or blackish stripes. It has a nauseous smell and taste; and when swallowed it affects the throat with a sense of heat, and occasions a plentiful discharge of saliva. When powdered it has a yellowish grey colour.

Such pieces should be chosen as are most compact, hard, weighty, dark-coloured, and abound most with black circular striæ and shining points: the light, whitish, friable, worm-eaten pieces, must be rejected.

Slices of bryony root are said to be sometimes mixed with those of jalap: but they may be easily distinguished by their whiter colour, and less compact texture, and by not easily burning at the flame of a candle.

Neumann got from 7680 parts, 2480 alcoholic, and then by water 1200, and inversely 2160 watery, besides 360, which precipitated,

during the evaporation, and 1440 alcoholic: the tincture extracted from 7680 parts, when precipitated by water, gave 1910.

Mr. Henry, who analysed several varieties of jalap found in commerce in France, obtained the following results.

	Extract.	Resin.	Residue.
Jalap leger,	75	60	270
—— *sain,*	140	48	210
—— *piqué,*	125	72	200

Besides the gummy extract and the resin, jalap contains amylaceous fæculum, which is preyed on by the worms, according to Henry, so that it is wrong to suppose that it was only the extractive which was destroyed by them. Jalap also contains several alkaline and earthy salts.

Medical use.—Jalap in substance, taken in a dose of about half a drachm (less or more, according to the circumstances of the patient) in plethoric, or cold phlegmatic habits, proves an effectual, and in general a safe purgative, performing its office mildly, seldom occasioning nausea or gripes, which too frequently accompany the other strong cathartics. In hypochondriacal disorders, and hot bilious temperaments, it gripes violently, if the jalap be good; but rarely takes due effect as a purge. An extract originally made by water purges almost universally, but weakly; and at the same time has a considerable effect by urine: what remains after this process gripes violently. The pure resin, prepared by spirit of wine, occasions most violent gripings, and other distressing symptoms, but scarcely proves at all cathartic: triturated with sugar, or with almonds, into the form of an emulsion, or dissolved in spirit, and mixed with syrups, it purges plentifully in a small dose, without occasioning much disorder: the part of the jalap remaining after the separation of the resin, yields to water an extract, which has no effect as a cathartic, but operates powerfully by urine.

The following letter from Dr. Barton, Professor of Botany in the University of Pennsylvania, to the late Dr. Dorsey, and which I received from that gentleman a short time before his death, will serve to show that the jalap is a native of Georgia and of West Florida.

15*th Dec.* 1816.

Dear Doctor,

In our conversation respecting the jalap, I mentioned that it is now ascertained to be a native of the United States. I will give you the result of the late enquiries which have been made on this subject.

Bernard Romans had some time since asserted, that the true jalap grew wild near Pensacola, in West Florida. Desfontaine, a celebrated French botanist, who has written an interesting history of the plant, accompanied by an engraving of it, asserted in his paper, that it was a native of the United States. Michaux the father, first discovered the jalap in our country. He describes it as growing near the sea shore in Georgia, "habitat in maritimis Georgiæ et Floridæ."

It must not be concealed, however, that he describes the jalap under the name of *ipomœa macrorhiza*, or large rooted Ipomæa, (the root sometimes weighs 50 or 60 pounds.) As he does not intimate the most remote suspicion of this plant being the real jalap, we are warranted in saying he was unacquainted with that fact. Mr. Persoon, however, an eminent French botanist, now living, gave it as his opinion, that the Ipomæa macrorhiza of Michaux, was really the officinal jalap.

The late Professor Barton has declared, that the jalap is not a native of the United States, and has given it as his opinion, that it is not even indigenous in West Florida. He grounded his disbelief of the facts adduced to the contrary, by Persoon, Desfontaine, and Romans, upon the trivial circumstance of the jalap being a species of *convolvulus*, and not of *ipomœa*. Now these two genera stand next to each other, and are so nearly allied, that the structure of the stigma alone, gives the only unequivocal mark of discrimination; —this part in convolvulus being *filiform* and *bifurcated*, and in ipomæa *capitated*, or supporting a button-like head. It is worthy of remark, however, that at the very time the Professor was endeavouring to do away the opinion of jalap being a native plant of the United States or West Florida, he observes "that the plant alluded to by Romans, is in all probability, the *ipomœa macrorhiza* of Michaux!"—And so in reality it is, but the *ipomœa macrorhiza* of Michaux, is indubitably the officinal jalap, or the plant hitherto described by Linnæus, Willdenow, Woodville, and others, under the name of convolvulus jalapa. This is satisfactorily made out from the late publication of Mr. Pursh, on the plants of North America. He describes the ipomæa macrorhiza, under the name of *ipomœa jalapa;* and says in his observations respecting it: "I have frequently received seeds and roots of the ipomæa macrorhiza from Georgia myself, but little did I suspect it to be the true *convolvulus jalapa*, till two circumstances convinced me thereof. The first was, seeing a paper on this subject in the *Annales du Museum d'Histoire Naturelle*, by Desfontaines,* and the other, on seeing the living plant recently raised out of a collection of seeds brought from Mexico, in possession of A. B. Lambert, Esq. which in every respect proved to be the *convolvulus jalapa* of Linnæus, as well as *ipomœa macrorhiza* of Michaux, with only the small difference of colour, which was a light purple, but this is of no consequence in this family of plants."

This last circumstance respecting the inconstancy of colour in the convolvulus, is corroborated by the account given of jalap by Woodville, who says, "the colour will no doubt vary. The plant at Kew produced reddish flowers, but the plants obtained by Houston from the Spanish West Indies, had flowers externally of a reddish colour but of a dark purple within."

It appears, then, that from the observation of Mr. Pursh, on the living plant, there is no doubt left of the identity of *convolvulus jalapa*, and *ipomœa macrorhiza;* and it further appears that as

* A translation of this paper may be seen in the 21st volume of the Medical and Physical Journal, p. 302. Ed.

Professor Barton was of opinion that the plant described by Bernard Romans as growing wild near Pensacola, in West Florida, was really the ipomæa macrorhiza of Michaux, we have in addition to the facts adduced by Persoon, Desfontaines and others, the authority of the American Professor to assert that the genuine jalap of the Materia Medica, is a plant indigenous to West Florida and Georgia.

Truly yours,

WILLIAM P. C. BARTON.

CONVOLVULUS PANDURATUS. *A.*

Wild Potatoe. The Root.

This is supposed by Professor Barton to be the Mechameck or wild-rhubarb of some of our Indians. In the state of Delaware it is called wild potatoe vine; and the root Kussauder, or Kassader (a corruption of the word Cassada.) From one of our species of Convolvulus, an extract has been procured, but little, if any thing, inferior to the scammony of the shops. In Virginia, and some other parts of the United States, the root of this plant has been much recommended in cases of gravel. It is used either in powder or in decoction. Dr. Harris, of New-Jersey, has found an infusion or decoction of the root very useful in his own case. He is persuaded, that it has enabled him to pass the calculous granules, with much facility.*

CORIANDRUM. *A.* Coriandrum Sativum. *E. D. L.*

Coriander. The Seeds.

Coriander is an annual, umbelliferous plant, a native of the south of Europe, differing from all the others of that class in producing *spherical* seeds. These, when fresh, have a strong disagreeable smell, which improves by drying, and becomes sufficiently grateful: they are recommended as carminative and stomachic.

COPTIS. *A.* (*Secondary.*) *Gold Thread. The Root.*

Coptis Trifolia. Nigella.

This is an elegant little evergreen, found in the swamps of the northern parts of our continent and in Siberia. It was ranked with

* Barton's Collections, Part I. p. 29. 54. Part II. 49.

the hellebore, until Mr. Salisbury constituted it a new genus under the name of *coptis*. In botanical arrangement it follows the hellebores in the class and order *Polyandria, Polygynia.*

The bright yellow colour of the roots, running in every direction, give the name of *gold thread* to the plant. These roots are intensely bitter, which is not communicated to water by distillation. They abound in a bitter extractive matter, soluble in water and in alcohol.

It is much used in Boston, from its supposed efficacy in aphthous and other ulcerations of the mouth, as a local application; a reputation deemed unmerited by Dr. Bigelow; who, however, maintains its title to rank, as a pure tonic bitter, with most articles of that kind in use: resembling gentian, quassia and colombo. A tincture made with half an ounce of the bruised root, with eight ounces of diluted alcohol, possesses the whole bitterness of the plant. It is given in doses of a tea-spoonful thrice a day, or of the powder from ten to twenty grains.

CORNUS FLORIDA. *A. Dogwood. The Bark.*

This beautiful shrub is found in every part of the United States. In the New-England States it is known by the name of Boxwood. The bark is considerably astringent, and has long been employed in intermittent fevers. A decoction of it has likewise been found useful in the yellow water of horses, so fatal within the few last years. An agreeable bitter is made by infusing the ripe fruit or berries in spirits or brandy. The Indians employ an infusion of the flowers in intermittents; and the same has been recommended in flatulent colic.

The bark of the root, stem, and smaller branches, is employed. That of the root is deemed most efficacious. It is sometimes combined with the bark of the Liriodendron, either in decoction or in substance.*

CORNUS SERICEA. *A.* (*Secondary.*)

Swamp Dogwood. Red Willow. Rose Willow. The Bark.

The bark of this shrub has been found but little inferior to the common pale Peruvian bark in intermittents.

The bark forms a beautiful tincture with proof spirits, and is, as also the powdered bark of both species, deserving of a place in the shops.†

For a particular account of these vegetables, the reader is referred to Dr. John M. Walker's "Experimental inquiry into the similarity in virtue between the Cornus Florida and Sericea, and the Cinchona Officinalis of Linnæus, &c. &c. Philadelphia, 1803."

* Barton's Collections, Part I. p. 12. 45. † Barton's Collections, Part I. p. 12.

CORNUS CIRCINATA. *A.* (*Secondary.*)

Round-leaved Dogwood. The Bark.

This plant has not been noticed in either of the Medical Botanies published by Professors Bigelow or Barton. We presume it might have been omitted without any detriment to the practitioner.

COTULA. *A.* (*Secondary.*) *Mayweed. The Plant.*

ANTHEMIS COTULA. ***Wild Chamomile.***

Why this is introduced to notice, even in a secondary list, is difficult to say. Although a strong bitter, it is so inferior to the officinal chamomile, that when this last can be obtained, few will be induced to employ it.

CROCUS. *A.* CROCUS SATIVUS. *E. L. D.*

Saffron. The summits of the pistils.

Crocus is a bulbous-rooted perennial plant, probably a native of the East, although it is now found wild in England, and other temperate countries of Europe. It is very generally cultivated as an ornament to our gardens, and in some places for the saffron, which is formed of the dried summits of the pistil, and not of the filaments, as stated by the Dublin College. Each flower has one pistil, the summit of which is deeply divided into three slips, which are of a dark orange-red colour, verging to white at the base, and are smooth and shining. Their smell is pleasant and aromatic, but narcotic; their taste a fine aromatic bitter, and they immediately give a deep yellow colour to the saliva when chewed. The flowers are gathered early in the morning, just before they open; the summits of the pistils are picked out, very carefully dried by the heat of a stove, and compressed into firm cakes. In Great Britain the saffron is superior to what is imported from other countries, and may be distinguished by its blades being broader.

On the continent they reckon the Austrian and the French from Gatinois the best. The Spanish is rendered useless, by being dipt in oil, with the intention of preserving it. Saffron should be chosen fresh, not above a year old, in close cakes, neither dry, nor yet very moist; tough and firm in tearing; difficultly pulverizable; of a fiery, orange-red colour; of the same colour within as without; of a strong, acrid, diffusive smell; and capable of colouring a very large proportion of water or alcohol. Saffron which does not colour the fingers

when rubbed between them, or stains them with oil, has little smell or taste, or a musty or foreign flavour, is too tender, and has a whitish, yellowish or blackish colour, is bad. It is said that it is sometimes adulterated with the fibres of smoked beef, and with the flowers of the carthamus tinctorius, calendula officinalis, &c. The imposition may be detected by the absence of the white ends, which may be observed in the real saffron, by the inferior colouring power, and by the want of smell, or bad smell when thrown on live coals.

By distillation with water, saffron furnishes a small proportion of essential oil, of a golden yellow colour, heavier than water, and possessing the characteristic smell in an eminent degree. According to Hermbstadt, the soluble matter of saffron is extractive nearly pure. Neumann obtained from 480 dried saffron, 360 grains of watery extract, which was soluble in alcohol, except 24 of a colourless matter like sand, and afterwards 20 of alcoholic; and inversely, 320 of alcoholic extract entirely soluble in water, and then 90 of watery.

On account of the great volatility of the aromatic part of the saffron, it should be wrapt up in a bladder, and preserved in a box or tin case.

Medical use.—Saffron is a very elegant aromatic: besides the virtues which it has in common with all the bodies of that class, it has been alleged that it remarkably exhilarates, raises the spirits, and is accounted one of the highest cordials: taken in large doses, it is said to occasion immoderate mirth, involuntary laughter, and the ill effects which follow from the abuse of spirituous liquors. The medicine is also said to be particularly serviceable in hysteric depressions, or obstruction of the uterine secretions, where other aromatics, even those of the more generous kind, have little effect. But some experiments made by Dr. Alexander serve to show that it is much less powerful than was once imagined: and it was given in the Edinburgh Infirmary by Dr. Henry Cullen, even to the extent of half an ounce a day, in several hysterical cases, without any sensible effect whatever; so that of late the estimation in which it was held as a medicine has been on the decline!

CUBEBA. *A.* Piper Cubeba. *The Fruit. Cubebs.*

What new virtues have been latterly found amongst us in this *old* remedy, to entitle it to a place *amongst* the *standard* and approved articles of the Materia Medica, when it has long ceased to cumber the shelves of Europe, I know not. It may be well to know, that formerly cubebs were considered to "strengthen a cold and moist stomach, expel wind, ease the spleen, cleanse the breast of tough humours, help colds, asthmas, coughs, shortness of breath, hoarseness; warm and comfort a cold womb, strengthen the head, heart and brain, &c." (Salmon.) In vain did they possess those panaceal pow-

ers; they were suffered to sink into oblivion; but at length are resuscitated in a more congenial hemisphere!

It may be proper to state, that lately this article has been ushered into practice for the cure of gonorrhœa, with all the extravagance of praise which usually attends the revival of an old, or the introduction of a new remedy. It has been pronounced to be a *specific* in this complaint; but it is probable that experience will not warrant these assertions.

CURCUMA. *A.* (*Secondary.*)

Curcuma Longa. *Turmeric. The Root.*

This, like the preceding, has been taken up by our Pharmacopœia, just as the last of the British Colleges had discarded it from use!

Turmeric is a perennial plant, a native of the East Indies. The roots are tuberous, knotty, and long; wrinkled, externally of a pale yellow colour, and internally of a shining saffron brown. They have a weak aromatic smell, and a slightly bitter aromatic taste. They contain a very little essential oil; and Neumann got from 960 parts, 320 watery, and afterwards 50 alcoholic extract, and inversely 150 alcoholic, and 210 watery.

Medical use.—Turmeric, when taken internally, tinges the urine of a deep yellow colour, and acts as a gentle stimulant. It has been celebrated in diseases of the liver, jaundice, cachexy, dropsy, intermittent fevers, &c. But its internal use in Great Britain is almost confined to its being a principal ingredient in the composition of curry powder, in which form it is used in immense quantities in the East Indies. It is a valuable dye-stuff; and also an excellent chemical test of the presence of uncombined alkalies; for the yellow colour of turmeric is changed by them to a reddish brown.

CUPRUM.—*COPPER.*

This metal is of a bright red colour, disagreeable taste and smell when rubbed or heated; sp. gr. 7.79; ductile; of great tenacity: sonorus; fusible at 27° Wedgwood; granulated texture, and subject to blisters; a good conductor of caloric, electricity, and galvanism; becomes brown, and at last green in the air; when heated, turns blue, yellow, violet, deep brown; when ignited and plunged into water, forms brown, brittle scales of oxyd. Its phosphuret is brilliant, brittle, hard and fusible; its sulphuret, brown, fusible, and very phosphoric; its alloy with arsenic is white, with bismuth reddish, with antimony violet, mercury deep red, with zinc forms brass, and

with tin is orange; it is oxydized and dissolved by the sulphuric, nitric, and muriatic acids; its oxyd is brown, brittle, and soluble in ammonia, producing a beautiful blue.

Copper is found in many countries,

a. In its metallic state:
1. Crystallized.
2. Alloyed with arsenic and iron.
3. Sulphureted.

b. Oxydized:
4. Uncombined.
5. Combined with carbonic acid.
6. ——————— sulphuric acid.
7. ——————— arsenic acid.
8. ——————— Muriatic acid.
9. ——————— Phosphoric acid.

Copper has a more perceptible smell and taste than almost any other metal. Its effects when taken into the stomach are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting, colic pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, headach, vertigo, delirium; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors, or to destroy its virulence by solutions of potass, or sulphuret of potass.

Poisoning from copper is most commonly the effect of ignorance, accident, or carelessness; and too many examples are met with of fatal consequences ensuing, upon eating food which had been dressed in copper vessels not well cleansed from the rust which they had contracted by lying in the air; or pickles, to which a beautiful green colour had been given, according to the directions of the most popular cookery books, by boiling them with halfpence, or allowing them to stand in a brass pan until a sufficient quantity of verdigris was formed.

Great care ought to be taken that acid liquors, or even waters, designed for internal use, be not suffered to stand long in vessels made of copper, otherwise they will dissolve so much of the metal as will give them dangerous properties. But the sure preventive of these accidents is to banish copper utensils from the kitchen and laboratory. The presence of copper in any suspected liquor is easily detected by inserting into it a piece of polished steel, which will soon be coated with copper, or by dropping into it some carbonat of ammonia, which will produce a beautiful blue colour if any copper be present.

But although copper be thus dangerous, some preparations of it are, in certain cases, used with great advantage both externally and internally.

The chief of these are,

1. The sub-acetat of copper, or verdigris.
2. The sulphat of copper, or blue vitriol.
3. The sub-sulphat of copper and ammonia.
4. The muriat of copper and ammonia.
5. A solution of the sulphat of copper, and super-sulphat of alumina in sulphuric acid.

The two first of these are never prepared by the apothecary, but are bought by him from the manufacturer.

Copper in its *metallic* state is inactive on the system. Sufficient evidence of this exists in cases of its accidental swallowing, and when taken with suicidal intentions. Dr. Paris mentions the case of a young woman who swallowed six copper pennies; she was attended in the Westminster Hospital for two years, for a disease considered visceral, but which was the effect of the mechanical obstruction of the coin. She voided them after a lapse of five years, and during that long period, not a symptom arose, which could be attributed to the poisonous influence of the copper. In another case of a child, a halfpenny swallowed remained in the intestines six months; and formerly, the metallic filings were taken in drachm doses with impunity as a remedy for rheumatism.

Sub-Acetas Cupri. Ærugo. *E. L. D.* Cupri Sub-Acetas. *A.*

Sub-Acetat of Copper. Verdigris.

The preparation of this substance was almost confined to Montpelier in France, owing chiefly to an excellent regulation which existed, that no verdigris could be sold until it had been examined and found of sufficiently good quality. For since that regulation has been abolished, Chaptal informs us, that so many abuses have crept into the manufacture, that the Montpelier verdigris has lost its decided superiority of character. It is prepared by stratifying copper plates with the husks and stalks of the grape, which have been made to ferment after the wine has been expressed from them. In from ten to twenty days, when the husks become white, the plates of copper are taken out, and their surfaces are found to be covered with detached and silky crystals. They are now placed on edge, with their surfaces in contact, in the corner of a cellar, and alternately dipt in water, and replaced to dry every seven or eight days, for six or eight times. By this management, the plates swell, and are every where covered with a coat of verdigris, which is easily separated with a knife. In this state it is only a paste, and is sold by the manufacturers to commissioners, who beat it well with wooden mallets, and pack it up in bags of white leather, a foot high and ten inches wide, in which it is dried by exposing it to the air and sun, until the loaf of verdigris cannot be pierced with the point of a knife.

Sub-acetat of copper should be of a bluish green colour, dry and difficult to break, and should neither deliquesce, have a salt taste, contain any black or white spots, nor be adulterated with earth or

gypsum. Its purity may be tried by diluted sulphuric acid, in which the sub-acetat dissolves entirely, and the impurities remain behind.

Verdigris, as it comes to us, is generally mingled with stalks of the grape; they may be separated, in pulverization, by discontinuing the operation as soon as what remains seems to be almost entirely composed of them. Acetat of copper is readily prepared by adding acetat of lead to sulphat of copper, both in solution; an insoluble sulphat of lead precipitates; and by evaporating the supernatant fluid the verdigris is procured in very beautiful crystals.

Medical use.—Verdigris is never, or rarely used internally. Some writers highly extol it as an emetic, and say, that a grain or two act as soon as received into the stomach; but its use has been too often followed by dangerous consequences to allow of its employment. Verdigris, applied externally, proves a gentle detergent and escharotic, and is employed to destroy callous edges, or fungous flesh in wounds. It is also advantageously applied to scorbutic ulcers of the mouth, tongue, or fauces, and deserves to be carefully tried in cancerous sores. With these intentions it is an ingredient in different officinal compositions. The best remedy for persons poisoned by verdigris, or any cupreous salt, appears to be sugar, largely administered. (See Orfila's Toxicology, vol I.) Admitting this to be absolutely the case, it may be worth the trial, whether the cupreous salts may not prove of infinite service in cases of diabetes; independently of its tonic powers in small doses, it probably may tend to destroy the disposition existing in that disease, to produce the saccharine matter which is found in the urine.

Cupri Sub-Acetas Præparatum. *A.* Ærugo Præparata. *D.*

Prepared Sub-Acetat of Copper. Prepared Verdigris.

Take of

Verdigris, any quantity.

Grind it to powder, and separate the minute particles as directed for the preparation of carbonat of lime.

The intention of this process is merely to obtain the sub-acetat of copper in the state of the most minute mechanical division.

CUPRI AMMONIARETUM. *A. E.* Cuprum Ammoniatum. *L. D.*

Ammoniaret of Copper. Ammoniated Copper.

Take of

Sulphat of copper, ... two parts;

Carbonat of ammonia, . . . three parts.

Rub them together in a glass mortar, until, after the effervescence has ceased, they unite into a violet coloured mass. This must be wrapped up in blotting paper, and first dried on a chalk stone, and afterwards by a gentle heat. The product must be kept in a well stopped glass phial.

We may observe here, that, chemically speaking, it is not a *carbonat*, but a *sub-carbonat* of ammonia, that we employ; and also, that the term ammoni*aret*, employed by the Convention, and by the Edinburgh College, ought to be ammoni*uret*, in strict conformity with the nomenclatural exposition of Lavoisier.

It may seem strange, that particular directions should be given concerning the manner of drying a mixture which is prepared by rubbing two dry substances together. But such a phenomenon is by no means uncommon, and arises from the quantity of water of crystallization contained in the ingredients being greater than what is required in the new compound formed: As soon, therefore, as the ingredients begin to act upon each other, a quantity of water is set at liberty, which renders the mass moist.

The nature of this compound, and consequently the name which should be given it, is not yet sufficiently ascertained. Prepared according to the directions of the colleges, it evidently contains oxyd of copper, ammonia, and sulphuric acid. If these substances be chemically combined, it should be denominated the sulphat or subsulphat of copper and ammonia. By exposure to the air during its exsiccation, and by keeping, it is apt to lose its blue colour entirely, and become green, and is probably converted into carbonat of copper. It should therefore be prepared in small quantities at a time.

Medical use.—Ammoniuret of copper has been strongly recommended in epilepsy; but, from its good effects sometimes ceasing after it has been used for some time, a want of success in some cases, and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. In the practice of some, its success, it is said, has been almost uniform and astonishing. It is employed by beginning with doses of half a grain twice a day, and increasing them gradually to as much as the stomach will bear. Dr. Cullen sometimes increased the dose to five grains.

It is evident, that in prescribing this salt, as a combination of ammonia and copper, the sulphuric acid has been overlooked, as to any use it might have had in establishing the powers of the remedy. It would not be amiss to compare its merits directly with those of an ammoniuret of copper, formed by digesting the copper in aqua ammonia, and evaporating to crystallization.

CUPRI AMMONIARETI LIQUOR. *A.*

AQUA (LIQUOR. *L.*) CUPRI AMMONIATI. *D.*

Solution of Ammoniaret of Copper.

Solution (Water) of Ammoniated Copper.

Take of
- Lime water, ... fresh made, eight ounces;
- Sal ammoniac, ... two scruples;
- Verdigris prepared, . . . four grains.

Mix and digest them for twenty-four hours, then pour off the pure liquor.

In this preparation the lime water decomposes the muriat of ammonia and forms muriat of lime; while the ammonia disengaged immediately re-acts upon the oxyd of copper contained in the verdigris, and renders it soluble. But as the quantity of lime employed is not sufficient to decompose all the muriat of ammonia, the solution contains muriat of ammonia, muriat of lime, and ammoniuret of copper, forming probably a triple salt, with the acetic acid.

Medical use.—This compound solution is applied externally for cleaning foul ulcers, and disposing them to heal. It has been recommended also for taking off specks and films from the eyes; but when used with this intention, it ought to be diluted with some pure water, as in the degree of strength in which it is here ordered, it irritates and inflames the eyes considerably. It is the best test of arsenic, which changes its blue colour into green.

If this preparation is considered simply as the preceding salt in solution, it would obviously be preferable to dissolve a definite quantity of that salt in a given amount of water; but from what is said above, it is evidently a solution of a very compound nature. What the action of the other articles in it may be, in a medical point of view, can only be learned by careful comparative experiments with the simple ammoniuret and this.

CUPRI SULPHAS. *A. E. L. D.*

Cuprum Vitriolatum. Vitriolum Cœruleum.

Sulphat of Copper. Blue Vitriol. Blue Stone.

This metallic salt is rarely formed by combining directly its component parts, but it is obtained, either by evaporating mineral waters which contain it, or by acidifying native sulphureted copper, by exposing it to the action of air and moisture, or by burning its sulphur.

When pure it has a deep blue colour, and is crystallized generally in long rhomboids. It effloresces slightly in the air, is soluble in four parts of water at 60°, and in two at 212°, and is insoluble in alcohol. By heat it loses, first its water of crystallization, and afterwards all its acid. It is decomposed by the alkalies and earths, and some of the metals, the alkaline carbonats, borats, and phosphats, and some metallic salts.

When treated with sulphuric acid, no effervescence occurs, by which this salt is at once distinguished from *ærugo*. It is composed of 42 parts of an hydro-oxyd of copper, 33 sulphuric acid, and 25 water of crystallization. The hydro-oxyd consists of 24 parts of copper, 8 oxygen, and 10 water.

Medical use.—The sulphat of copper has a strong, styptic, metallic taste, and is chiefly used externally as an escharotic for destroying warts, callous edges, and fungous excrescences, as a stimulant application to ill-conditioned ulcers, and as a styptic to bleeding surfaces. Taken internally, it operates, in very small doses, as a very power-

ful emetic. It has, however, been exhibited in incipient phthisis pulmonalis, intermittent fever, croup, and epilepsy; but its use is not free from danger.

CUPRI SULPHATIS LIQUOR. *A.*

Solution of Sulphat of Copper.

Take of
Sulphat of copper, ... three grains;
Sulphuric acid, ... ten minims;
Distilled water, ... two fluid ounces.
Mix the articles, and effect a solution by shaking them.

We suppose this is intended as a simplification of the Solutio Sulphatis Cupri Compositi of the Edinburgh College. Whether it is equally useful as a styptic, we should much doubt. The sulphat of copper being already a *super salt,* the sulphuric acid is probably an unnecessary addition, as no chemical action ensues between the substances employed.

Medical use.—It is chiefly used as a styptic for stopping bleedings at the nose; and for this purpose, cloths or dossils, steeped in the liquor, are to be applied to the part.

CYANOGEN.

This is the name given by Gay Lussac to the compound of carbon and nitrogen, (a carburet of nitrogen.) It is a colourless gas, of a strong disagreeable smell, which burns with a purplish blue flame, and is not decomposed by exposure to a red heat. Its sp. gr. is 1.8064. It is absorbed by water and alcohol, and its solutions redden litmus. It is called cyanogen from χυανος (*color cœruleus*) as being the base of that acid which in combination with iron, &c. gives rise to the blue pigment, known by the name of Prussian blue.

When the above base (cyanogen) is combined with hydrogen in certain relative proportions, a very singular acid is produced called

Hydrocyanic, or Prussic Acid.

This is a colourless fluid, of a strong smell, like that of bitter almonds or peach kernels; of a sweetish pungent taste. It does not redden vegetable blues. It consists of carbon, nitrogen and hydrogen, and is easily decomposed by light, heat and chlorine. It does not act upon the metals, but forms coloured and generally insoluble combinations with their oxyds. It is obtained from animal substances by the action of heat, nitric acid, fixed alkalies and putrefaction. It exists in some peculiar state of combination in bitter almonds, and most of the bitter seeds, as black cherry, &c. also in

the leaves of the prunus lauro-cerasus, peach, &c. from which it may be obtained by distillation, as laurel water, black cherry water, &c.

This singular base (cyanogen) is also acidified by combining with some other substances; thus, in union with black oxyd of iron, which seems to form an acidifying principle to it, it constitutes the Ferro Cyanic Acid, which is of a pale lemon colour, without smell, and is decomposed by a gentle heat or strong light. It forms directly with alkalies and earths, the salts heretofore called *triple prussiats.*

With *sulphur,* cyanogen constitutes the Sulpho Cyanic Acid, which is colourless or pinkish, and with a pungent smell like strong acetic acid. Both these acids were discovered by Mr. Porrett.

With *chlorine,* cyanogen constitutes the Chloro Cyanic Acid.

Hydrocyanic or prussic acid forms too important a subject in the lists of medicine at present, to be cursorily passed over.

The use of laurel water had been long known for domestic use, as a cordial, and to give flavour to various articles of cookery, and was supposed to be perfectly harmless. Ray, whose large botanical work was published in 1686, speaking of the Lauro Cerasus, (vol. 2. p. 1519,) says "De viribus hujus arboris ejus que fructuum in medicina, nihil traditum invenio." Hence no suspicion of any danger from its use in any way appears to have existed, before its fatal effects were suddenly exemplified in a young woman, whose case is recorded by Dr. Rutty, in one of the early volumes of the Philosophical Transactions of Great Britain. Several similar cases successively appeared—one of which, a girl of 18 years of age, well and hearty, took less than two spoonsful of the first runnings of the simple water of laurel leaves. Within half a minute she fell down, was convulsed, foamed at the mouth, and died in a short time.

Experiments multiplied in respect to this distilled water, and have at different times been largely pursued; but no idea was entertained that its poisonous property arose from the presence of prussic acid, until the experiments of Bohn proved its existence, by actually forming the Prussian blue, through the agency of chemistry, from this and analogous distilled waters. It was indeed impossible that it should be otherwise, for prussic acid itself was unknown, until the time of that most illustrious of chemists of any age or country, Scheele, whose extent of discoveries in his favourite science, is only equalled by the apparently inadequate means he possessed for this. But let us not anticipate. In the year 1710, the beautiful pigment called *Prussian blue,* was accidently discovered at Berlin in Prussia—hence its name of Berlin or Prussian blue—a name by which it is generally known even at this time. For 15 years the process seems to have been kept a secret—at length the preparation was given in the Philosophical Transactions, by which it appeared to be formed of an alkali with blood—to a lixivium of which, after roasting, green vitriol and alum were added; a precipitate was produced of a greenish colour, which by the addition of muriatic acid, assumed the blue appearance.

For a time this lixivium was known by the name of Prussian alkali. Its composition was, however, but slightly comprehended, until

Scheele, finding that when Prussian blue was boiled with pure alkali, it lost its blue colour, whilst the alkali acquired the property of precipitating solutions of iron of a blue colour; concluded that it had become saturated with the colouring matter; and as it was then capable of crystallization or of forming a salt, that it was of the nature of an acid. What it was he knew not; but he discovered that it was of a volatile nature, and that by exposure to the air, it escaped. Many were the experiments which he performed in order to procure it in an insulated form—at last he succeeded, and has left the following process as the most accurate and correct.—It is that, which, *in part,* our Pharmacopœia has adopted, and it is incorrect only where it deviates from that of Scheele. It is the one I think, if properly pursued, which is best adapted to give an uniform preparation for the purposes of medicine. It is not, like that of some later processes, so readily decomposed by light aud other accidental causes. I have some now as strong and as perfect as when first made, upwards of 10 or 12 years ago, preserved only in a tight glass stoppered bottle, without any particular care in secluding it from the light. His process was as follows:

Sect. IX —To two ounces of powdered Prussian blue, and one ounce of calx of quicksilver, prepared by means of nitrous acid, I added six ounces of water in a cucurbit; I boiled this mass for some minutes with constant agitation, when it assumed a yellowish grey colour. I then poured it out on a filter, and upon what remained in the filter I poured a couple of ounces of hot water, in order to elixiviate the whole thoroughly. The strained mercurial solution was then poured upon an ounce and a half of iron-filings, free from rust, and contained in a glass vessel, there being added three drachms of concentrated vitriolic acid. The whole mass was well agitated, during which, in a few minutes, it was turned quite black by the reduced quicksilver, and thereby completely lost its quicksilver taste. It, at the same time, acquired the peculiar smell of the colouring matter. I left the mixture a few minutes at rest; then poured off the clear liquor into a retort; and distilled the fourth part of it off into a well luted receiver. Here I obtained the same colouring matter as from the neutral salt (§ VI). It is sufficient to distil off one-fourth; for this matter is much more volatile than water, and goes over first.

Sect. X.—A slight vestige of vitriol easily appears in this (§ IX.), as well as in the preceding distillation of the neutral salt (§ VI.). This little vitriolic taint must consequently be likewise separated from the colouring matter. I have remarked (§ I), that ærial acid is capable of dislodging this matter from alkali and lixivium sanguinis The same thing happens if this matter be combined with lime. It is therefore not difficult to separate the vitriolic acid from it. I mixed a little pounded chalk with the distilled water impregnated with this matter, and distilled the mass a second time by a gentle fire The vitriolic acid united during this process with the chalk, and the colouring matter went over in its greatest purity In order to hinder, as much as possible, the escape of this volatile matter through the lute, and in order to prevent the air in the receiver from absorbing too much of it, I make use of a small receiver, pouring a little distilled water into it, and place it so that the greatest part of the receiver, during the operation, shall be immersed in cold water This matter has a peculiar, but not disagreeable smell, a taste somewhat approaching to sweet, and warm in the mouth, at the same time exciting cough —*Scheele's Chemical Essays, Lond.* 1786. p. 333.

Compare this now with the following formula of the National Pharmacopœia.

ACIDUM PRUSSICUM. *A.* *Prussic Acid.*

Take of
Prussiat of iron, ... four ounces;
Nitric oxyd of mercury, . . . two ounces and a half;
Distilled water, ... one pint.

Boil in a glass vessel until the oxyd of mercury has wholly disappeared; filter the solution, and afterwards pour upon the strainer three fluid ounces of hot distilled water. Put the filtered solution into a long-necked and tubulated glass retort, and adapt a receiver containing one fluid ounce of distilled water. The receiver should have a bent tube extending from it to a cup of water, to carry off the hydrogen gas. Introduce two ounces of purified iron filings through the tubulure into the retort, and afterwards two ounces (by weight) of sulphuric acid. Surround the receiver with ice, or very cold water, and distil without boiling, from a sand bath, three ounces.

Certainly the comparison is no way favourable to the one recommended to us. We perceive that Scheele, after decomposing the mercurial solution by the iron and sulphuric acid, allowed the preparation to settle, and *then poured off the clear liquor* into a retort, and distilled off a fourth part, which contained the prussic acid in solution. He then secured its purification by a *second distillation* with a little chalk, which retained any vitriolic acid which might have previously passed over.

In the present formula, the liquid containing the acid, is not poured off from the other substances; but the distillation is at once pursued, from the same vessel in which the decomposition of the prussiat of mercury is effected; making it necessary to have a *bent tube to carry off the hydrogen gas.* But is not the prussic acid volatile? is it not capable of escaping by the same passage through which the hydrogen goes? Can it then be as strong as Scheele's? and is it not likely to be contaminated!

The continuance of Scheele's experiments soon led him to conclude, that this acid is a compound of ammonia, or of its elements, with carbon. Thus he formed it by passing ammoniacal gas through a red hot tube containing charcoal, and thereby proved its composition, both synthetically and analytically.

Vauquelin's mode of obtaining prussic acid, is given in the 14th vol. p. 43, of the London Medical Repository.

Into a solution of two ounces of prussiat of mercury in sixteen ounces of water; pass as much sulphureted hydrogen gas, as will serve to decompose the salt, leaving an excess of the gas. Filter the liquor to separate the sulphuret of mercury formed, and treat the filtered liquid with excess of sub-carbonat of lead; shake the bottle until the excess of sulphureted hydrogen is absorbed—filter again, and the remaining liquor is diluted hydrocyanic acid, of a proper strength for medical purposes.

The plan adopted at Apothecaries' Hall, is to take one pound of

prussiat of mercury, one pound of muriatic acid, and five pounds of water; distil off four pounds, and rectify through chalk. The acid thus procured, has been severely animadverted on by Dr. Granville.

Gay Lussac first obtained this acid in a state of absolute purity: his process was to distil prussiat of mercury in a small tubulated retort with muriatic acid; a tube intervening between it and the receiver. The first part of the tube was filled with marble, to arrest any muriatic acid; the latter part with dry muriat of lime, to retain the moisture. The receiver was placed in snow and salt, and the acid passed over into it by a moderate heat. (See Practical Chemistry, p. 175.)

This is the substance which demonstrates the surprising activity which belongs to the acid. It is that with which the experiments of Magendie were made; a single drop producing instant death in animals.

According to Gay Lussac's views of this acid, it consists of one volume of carbon, half a volume of nitrogen, and half a volume of hydrogen—all condensed into one volume; or of one atom of cyanogen, and one of hydrogen.

In a review of Dr. Granville's "Practical Treatise on the internal use of hydrocyanic (prussic) acid, in Pulmonary Consumption," &c. an observation is made by the reviewer, which we suspect will come home forcibly to the feelings of many practitioners.

"We remember the time, when the sanguine hopes held out by this new remedy, would have caused our hearts to palpitate with joy, at the prospect in which suffering humanity might reasonably indulge; but twenty-five years of observation have somewhat chilled our feelings on these occasions, and we have long been convinced that a careful study of the causes, seat, nature, and indications of a disease, will enable the attentive practitioner to *effect most of what can be effected, by even a very few of the common remedies now in use*."*

The virtues of this powerful article, it seems to be now conceded, have been greatly over-rated. Dr. Elliotson, in his treatise on the hydrocyanic acid, affirms, that he had not found it, in pectoral complaints, deserving of the encomiums bestowed upon it: but he extols its virtues in dyspepsia, and functional disorders of the stomach. He found it of use in simple dry cough, and in spasmodic asthma; but in pneumonia and whooping cough, altogether useless. In phthisis it produced a slightly soothing effect, *occasionally*. In hemorrhages, in palpitations of the heart from organic derangements, and in all other disorders, where it is desirable to diminish the force of the blood's motion, our author apprehends the prussic acid will prove of little avail. Several hysteric, epileptic, and maniacal patients, took it without the smallest benefit; but it presently wrought a cure in the only case of chorea to which it was applied. In rheumatism it proved totally inert; but there is some ground for supposing it possessed of anthelmintic qualities. In the proportion of one or two drachms to a pint of water, it has appeared to allay the irritation of the prurigo pudendi, and some other cutaneous affections. To adults, Dr. E. generally gave it in doses of a single minim, thrice

* Medico-Chirurgical Review, March, 1821.

repeated in 24 hours; and provided neither nausea nor giddiness, (its first sensible effects) nor other inconvenience ensued, he gradually augmented to two, three, and even six minims. "Almost any adult will bear one or two minims, few more than five; three are generally borne and required, and very frequently four. One woman took seventeen minims, three times a day, without inconvenience, or benefit; eighteen brought on vomiting and giddiness." To the youngest infant may be given one fourth of a minum (i. e. half a drop, one minim being nearly two drops.) An overdose will produce vomiting, pain, and tightness at the stomach, with fainting; and if the quantity be immoderately large, convulsions and death. Decisive indications of the purity of the article, we are told, are, that the fluid should be colourless, and perfectly transparent, powerfully emitting the odour, and leaving on the tongue the flavour of bitter almonds. At the temperature of 60°, its specific gravity to distilled water is .9931 to 1. If it appears turbid, or deposit any sediment, its genuineness may be suspected. It is recommended to keep it in a dark and cool situation, as in an earthenware vessel, filled with water, and covered over.—*Medico-Chirurgical Review, March*, 1821.

The physical properties of this acid, as detailed by Dr. Granville, are:

1. Liquid, at common temperature, colourless, transparent, strong smell of bitter almonds; peculiar pungent bitter taste, at first bland and sweetish.

2. Volatilized at 20° *Cent.* (= 68° F.) boils at 26° (78°, F.) and at 15° below 0, (5° F.) it becomes concrete, and crystallizes in needles like nitrat of ammonia.

3. Specific gravity, 0.70583; when concrete, only 0.600; that of its vapour, 0.947.

4. Odour so strong and characteristic, as to produce almost immediate pain in the head, with deafness, unless *largely* diluted with air or water, as in the case of the acid prepared for medicinal purposes; otherwise it is the same smell with peach flowers or bitter almonds.

5. Great tendency to assume a gaseous form; decomposed by high temperature, or by the contact of light: carbonic acid, volatile alkali, and carbureted hydrogen gas, are given out, a carbonaceous matter remaining behind.

6. When brought near a body in a state of combustion, it instantly inflames, and burns with a blue flame. Water and alcohol dissolve it readily.

In the London Medical Repository, vol. 15, April, 1821, Mr. R. Maguire has given a new mode of obtaining the *hydrocyanic* (prussic) acid, with a sketch of the apparatus employed. It is apparently a very simple and easy process, and if uniformly adopted, will afford a preparation of the same strength.

Four ounces of distilled water are placed in a receiver, surrounded with ice, and the acid evolved from one ounce of pure crystallized cyanuret (prussiat) of mercury, by the addition of pure colourless

muriatic acid, is made to impregnate it. Three drops of this solution every three hours, produced all the sedative effects described by Dr. Granville so decidedly, as to cause a temporary suspension of its use.

Perhaps the following remark of the reviewer of Dr. Granville's work on prussic acid, may serve an useful purpose at the conclusion of this subject:

"Whilst we can make allowances for the partialities of an inventor, or reviver, of a favourite remedy, we think it the most friendly act to draw the author's, (*every practitioner's*) attention, *repeatedly* towards the fallacious nature of medical evidence, as proved by all historical records. At the same time, we are not among those who discourage the introduction of every *new* remedy as a dangerous innovation."—*Medico-Chirurgical Review*, 1821.

Prussiat of Iron.—*Prussian Blue.*

It is not necessary to enter into a detail of the manufacture of this article, which is more an object of painting than of medicine. It is, as above stated, employed in the formation of prussiat of mercury as the preparatory step to making the prussic acid. It is introduced to notice here, as having been successfully employed in uterine hemorrhage.—All that is known to me on this subject, is contained in the following extract of a letter from Dr. T. Thomas, of Maryland, to his son, then pursuing his medical studies in our university.

"I was induced to use the prussiat of iron in uterine hemorrhage, from a paper written by Dr. Hall, of Baltimore, and published in the Lyceum, a periodical work of that city. He details several violent cases of that disease, in which the prussiat of iron produced instant and most happy effects. Dr. Young, of this county, read a paper on this subject before our district Medical Society; he stated several cases successfully treated by it, and in all such cases he depends entirely upon this remedy. On the recommendation of these gentlemen, I was induced to use it, and was quite gratified with the result. I give ten grains mixed in a cup of milk, once every two hours: I have seldom had occasion to give more than three doses, before the disease yielded. One or two cases have occurred in which the remedy failed, though it had the effect of lessening the violence of the disease. A lady, in September last, in the seventh month of her pregnancy, on rising from her bed in the morning, was suddenly seized with a severe uterine hemorrhage. She was put to bed immediately, and ten grains of the prussiat of iron were given in a cup of milk; rest and quietness enjoined, and cold applications were ordered to the pubes. The medicine was repeated every two hours, until three doses were taken: she then complained of nausea and it was omitted: the discharge at this time was considerably lessened and finally ceased. In three days afterwards, on her using a little exertion, it was again brought on. Sacch. saturn. and opium were directed without any permanent effect. After employing all

the remedies usually recommended in this disease with only a temporary effect, the lady was directed to remain in bed and trust to rest. She went her full time, had an easy labour, and has never had so good a confinement.

Prussiat of Potash.

This article has never, I believe, been employed in the practice of physic. The following interesting experiments and observations, extracted from the inaugural essay of Dr. Burwell, a graduate of this University in 1814, lead us to imagine it may be found well deserving of a place in the Materia Medica.

"It was my original intention merely to repeat the experiments of Mr. Wollaston on the prussiat of potash; but finding that the article exerted very considerable influence on my pulse, I concluded that it would be interesting and perhaps useful (in connexion with my other experiments,) to observe its effects upon the system generally. Before entering directly upon the proper subject of this essay, I think it necessary to explain with what view Mr. Wollaston first instituted his experiments. In order to ascertain whether the blood of diabetic patients contained any saccharine matter in its composition, Mr. Wollaston instituted a series of experiments on the blood of persons, discharging daily large quantities of sugar in their urine—not the smallest portion of the substance was detected. From the result of these experiments he concludes that the saccharine matter found in diabetic urine, is formed in the stomach and conveyed directly from that viscus to the kidnies, without entering into the general circulation. To confirm the above conclusions, the same gentleman, in conjunction with Mr. Marcet, performed a number of experiments on the prussiat of potash. The point in view was, whether it could be detected when taken internally, in the blood or the secretions. After experimenting several times with the article above mentioned, they concluded that it was not absorbed into the general circulation, but carried from the stomach to the kidnies, by some unknown vessels Not having it in my power to perform the first set of experiments made on diabetic patients, I determined to repeat those on the prussiat of potash, with the view of ascertaining whether Messrs. Wollaston and Marcet were warranted in the conclusions contained in their paper, read before the Royal Society of London. Although my experiments are not as conclusive as they might be with sufficient time to push them to a greater extent, yet I am convinced from the results afforded, that this substance *is taken into the general circulation.* In two experiments I detected it as distinctly as the quantity of the substance which was taken would permit. It was my intention to have varied my experiments on a number of inferior animals, but unfortunately the press of time, and the difficulty of procuring the proper ones, prevented me from pursuing the subject to the extent which I contemplated."

"Experiment I.—At half past nine o'clock I took two grains of the prussiat of potash in solution—in one hour after I took three grains, and at the end of two hours after taking the first dose, I took an additional quantity of three grains, making the whole of the substance that I had taken at the expiration of two hours, amount to eight grains Upon examining my urine, three hours and a half after taking the first dose of the article, I found, by adding a small portion of the solution of iron, that a slight blue tinge was produced in it. In half an hour afterwards, being four hours from the commencement of the experiment, I repeated it on a quantity of urine, and found by the addition of sulphat of iron in solution, a very considerable precipitate of a blue colour to fall to the bottom of the vessel, shewing distinctly the presence of the prussic acid in the urine. I then had myself bled, for the purpose of ascertaining whether I could detect its presence in the serum of the blood. On the following day, when the serum had separated from the other parts of the blood, I presented a small portion of the solution of iron to it and distinctly perceived a blue colour to ensue,

proving beyond all doubt, the presence of the prussic acid. Several of my friends were present, among them, Messrs. Marshall and Von Britton, who fully coincide with me in opinion.

"EXPERIMENT II.—In the course of three hours I took in divided doses, ten grains of prussiat of potash. Upon examining my urine, three hours and a half after taking the first dose, I detected the presence of the prussic acid in a slight degree; half an hour after, its existence was very manifest. At this time I had myself bled, and found by adding a portion of sulphat of iron in solution to the serum, the same result as in the preceding experiment, though not so strongly marked. I then added a sufficient quantity of sulphuric acid to coagulate the serum, by which the blue colour was rendered much more apparent.

"EXPERIMENT III.—In two hours and a half I took eight grains of the article in solution, and in four hours its presence in the urine was readily detected. At this period I submitted again to venesection; but on trial of the above mentioned test the presence of the prussic acid was not perceptible. This circumstance I ascribed to the serum having been agitated and consequently rendered turbid, thus being insusceptible of the change of colour, on the exhibition of the proper test. From the result of the above experiments, I hold myself warranted in withholding my assent to the inferences of Messrs. Wollaston and Marcet. I feel thoroughly satisfied that the prussic acid is taken up by the lacteals into the general circulation, and conveyed by this route to the kidnies, through which organ it is eliminated from the system. Even allowing for a moment that its presence cannot be detected in the serum of the blood, how can we explain its existence in the urine? The chain of vessels on which Mr. Wollaston has devolved this function, rests on grounds too imaginary and fallacious, to warrant a conviction of their reality."

"I come now to the second part of my subject, or the influence which the prussiat of potass, when taken internally exerted on the pulse and system in general. I shall relate the experiments in the order they were performed, making some few observations on each, and afterwards such remarks as may naturally grow out of the general result.

"EXPERIMENT I.—I took one and a half grains of the prussiat of potass in solution, my pulse beating seventy-two strokes per minute. In ten minutes after it beat sixty-four strokes; in

minutes,	15	20	25	30	35	40	45	50	55	60	65	70
strokes,	64	62	60	60	58	62	62	64	64	64	70	72.

It will be observed that my pulse in the above experiment was suddenly reduced in frequency ten strokes, and that it vibrated between fifty-eight and sixty-four for the space of forty minutes, and then gradually rose to seventy-two, which was the standard at the commencement of the experiment.

"EXPERIMENT II.—I took a grain and a half in solution, pulse beating eighty-two strokes in a minute, in

min.	15	20	25	30	35	40	45	50	55	60	65	70
strokes.	80	80	75	76	74	74	74	74	72	75	75	76.

By a reference to this last experiment it will be found, that my pulse, during the first twenty minutes, was reduced only two strokes; it then suddenly fell from eighty to seventy-five, being seven strokes less than at the beginning of the experiment. It remained diminished in frequency, volume and force, from about thirty-five to forty minutes and upwards. Why the operation of the article was not as evident in this experiment during the first twenty minutes as in the preceding, may appear strange. In the first place my pulse was preternaturally frequent, being eighty-two strokes per minute at the beginning of the experiment. I presume that it was thus increased in frequency by something which I had either eaten or drank previous to the exhibition of the dose: or perhaps there was a slight degree of fever induced by the usual causes of such disease, it being the season of the year when the system is always more or less impregnated with the seeds of fever."

"Experiment III.—I took three grains in solution, my pulse beating seventy-six strokes per minute. In ten minutes it beat seventy-two. In

minutes,	15	20	25	30	35	40	45	50	55	60	65	70
strokes,	74	64	64	64	64	66	68	68	69	72	72	72

It will be seen in this experiment, that my pulse was lessened in frequency at one time twelve strokes, that it continued vibrating between sixty-four and sixty-six for twenty minutes, and then very gradually rose. During the operation of the article, my pulse was very irregular in point of time between each vibration, accompanied with considerable oppression, and a slight pain about my breast."

"Experiment IV.—I took five grains of the article in solution, my pulse beating seventy-two strokes per minute. In ten minutes after, it beat sixty-nine. In

minutes,	15	20	25	40	45	50	55	60	65	70	75	80	85	95	105	115	120
strokes,	69	66	69	69	66	66	63	66	62	60	60	59	54	54	54	51	54

In this experiment it will be observed, that my pulse was not so suddenly reduced in frequency as in the preceding, but that its ultimate impression was much more powerful, both in diminishing the frequency of the pulse, and in the time of its duration. For the first forty minutes my pulse was only reduced in frequency three strokes, in twenty minutes more it gradually fell to sixty-two, being ten strokes less than at the beginning of the experiment. At the expiration of fifteen minutes more it will be found to have lessened three strokes. It now fell to fifty-four strokes per minute, and remained stationary for thirty-five minutes; excepting once during the process, when it fell to fifty-one, which was nearly two hours after the article was administered. I examined my pulse three hours afterwards, and found it still lessened in frequency. During the last experiment, I frequently felt an uneasiness in different parts of my head; my face was alternately flushed and very pale, considerable weakness of my eyes, and disposition to sleep; my mind somewhat dejected, with general debility and indisposition to move about. Towards the close of the experiment, a considerable diaphoresis appeared, and likewise twitching of the tendons. My pulse during the operation was very much diminished both in volume and force, and was marked by considerable inequality in relation to the time of its vibrations, with oppression at my breast. My urine was increased in quantity, but a good deal of difficulty attended its evacuation. About three or four hours after the article was taken, my bowels became affected, and discharged liquid stools with some degree of griping

"In reviewing the results of the preceding experiments, the first circumstance that attracts our attention, is the uniform effect of the article in reducing the frequency of the pulse, without, in any instance, raising it above the natural standard: It moreover exerted considerable influence on the volume and force, producing general debility of the system, and rendering it disagreeable and irksome to use any exertion either of body or mind. A difficulty of breathing, with tightness and a slight pain in the breast, was particularly exemplified in the last experiment. There was, during the same experiment, considerable uneasiness of my head, at times amounting to pain, with weakness of my eyes, and a disposition to sleep. Towards the close, a diaphoresis was very distinct, appearing first in the forehead, breast, palms of the bands, and then gradually diffusing itself over the surface of the body. At this time all the disagreeable feelings above mentioned, disappeared. Several hours after taking the last dose of the article, when all the above symptoms had subsided, I felt some degree of pain and griping in my bowels, accompanied with a discharge of a liquid nature, which afforded relief and restored them to a state of quiescence. About the same time my urine was increased beyond the natural quantity, but great difficulty was experienced in expelling it, the bladder having in some measure lost its energy. This circumstance was repeatedly observed, the inclination frequently occurred, but the bladder was unable for several minutes to perform its function. This inability frequently continued for four and twenty hours. At no time during the whole series of my experiments, was the slightest nausea, or any alteration in the state of the stomach manifested. Although the generally receiv-

ed opinion of the present day, respecting the primary operation of all medicines on the human system, is, that they increase action; still I am compelled, by the results arising from the preceding experiments, to dissent from the application of this maxim to every article of a medicinal nature. I feel fully authorised in asserting, that the *sensible* operation of the prussiat of potass on the system, is that of a sedative, strictly so called. It uniformly lessened the frequency of the pulse, without, in any instance, increasing it beyond the natural standard.

"Its general effects on the system, moreover, go to prove the same point beyond all manner of doubt."

"Not having used the article myself, nor seen it used by others, I am wholly unprepared to say any thing in relation to its efficacy. Judging, however, from its general effects, I think it would be well adapted to those cases of increased excitement, when depletion, having been pushed to a certain extent, is contra-indicated by the debility which its further prosecution would endanger.

"In its operation it resembles opium so very closely, that I am induced to think it might be advantageously exhibited in many diseases, where that noble medicine is found efficacious. Perhaps by administering this remedy, we may procure the beneficial effects of opium without its disadvantages, such as stupor, languor, &c. which almost always follow its exhibition. Though the article indeed, produced general debility, and a disposition to sleep during its operation, yet in a few hours all those disagreeable effects passed off, leaving me in every respect as well as before I had taken it."

"Notwithstanding the virtues of this substance in relation to the cure of diseases, have not yet been ascertained, still, from a survey of its general operation on the system, I think it by no means improbable, that it will be found a highly valuable acquisition to the materia medica, and thus at no distant date be classed with those happy means we already enjoy of alleviating the maladies incident to our nature."

In the American Journal of Science and Arts, vol. 3. p. 187, will be found an interesting article, entitled "Reports and Memoranda of Cases in which the Prussic Acid has been administered." It is well worthy the perusal of every physician.

D.

DAPHNE MEZEREUM. *E. D. L.* MEZEREON. *A.*

Mezereon. Spurge Olive. The Bark of the Root.

Mezereon is a shrub which grows in woody situations in the northern parts of Europe, and is admitted into our gardens from its flowering in winter. The bark, which is taken from the trunk, larger branches, and root, is thin, striped reddish, commonly covered with a brown cuticle, has no smell, and when chewed, excites an insupportable sensation of burning in the mouth and throat. When applied to the skin in its recent state, or infused in vinegar, it raises blisters. Its acrid principle is said to be soluble in ether.

Medical use.—The root was long used in the Lisbon diet-drink, for venereal complaints, particularly nodes and other symptoms re-

sisting the use of mercury. The bark of the root contains most acrimony, though some prefer the woody part. Mezereon has also been used with good effects in tumours and cutaneous eruptions not venereal.

Dr. Cullen says that it acts upon the urine, sometimes giving it a filamentous appearance, and upon the perspiration, without diminishing the strength remarkably; and that in irritable habits it quickens the pulse, and increases the heat of the whole body. But Mr. Pearson, of the Lock Hospital, says, that excepting a case or two of lepra, in which a decoction of this plant conferred temporary benefit, he very seldom found it possessed of medicinal virtues, either in syphilis, or in the sequelæ of that disease. In scrofula, or in cutaneous affections, it is employed chiefly under the form of decoction; and it enters the decoctum sarsaparillæ compositum of the London college; but it has also been used in powder, combined with some inactive one, as that of liquorice-root. It is apt to occasion vomiting and purging; so must be begun in grain doses, and gradually increased. It is often combined with mercury.

The berries are still more acrid than the bark, and they have even been known to produce fatal effects on children, who have been tempted by their beauty to eat them. It is said that they are sometimes infused in vinegar, to make it more pungent, and appear stronger.

DATURA STRAMONIUM. E. D. STRAMONIUM. *A.*

Thorn Apple. Jamestown Weed, &c. The Leaves and Seed.

Pentandria Monogynia.—Nat. ord. *Solanaceæ.*

The Thorn-apple is an annual plant, a native of America, but now growing wild on dry hills and uncultivated places in England and other parts of Europe. The leaves are dark green, sessile, large, egg-shaped, pointed, angular, and deeply indented, of a disagreeable smell and nauseous taste. Every part of the plant is a strong narcotic poison, producing vertigo, torpor, death. The best antidote to its effects is said to be vinegar.

Crystals of nitrat of potash shoot in the extract as prepared by Storck, when kept several months.

Beverley, in his history of Virginia (1722, p. 121,) speaking of this plant, says, "This being an early plant, was gathered very young for a boiled sallad, by some of the soldiers sent thither to quell the rebellion of Bacon, and some of them eat plentifully of it; the effect of which was a very pleasant comedy; for they turned natural fools upon it for several days; one would blow up a feather in the air, another would dart straws at it with much fury, and another stark naked, was sitting up in a corner, like a monkey, grinning, and making mows at them; a fourth would fondly kiss and paw his companions, and sneer in their faces, with a countenance more antic

than any in a Dutch droll. In this frantic condition they were confined, lest they should in their folly destroy themselves, though it was observed that all their actions were full of innocence and good nature. Indeed, they were not very cleanly, for they would have wallowed in their own excrements, if they had not been prevented. A thousand such simple tricks they played, and after eleven days, returned to themselves again, not remembering any thing that had passed."

Medical use.—Dr. Storck first tried it as a remedy in mania and melancholy with considerable success. Several cases of the same diseases were also cured or relieved by it, under the direction of different Swedish physicians; and although in other experiments it frequently failed, it deserves the attention of practitioners, and well merits a trial, in affections often incurable by other means.

Besides maniacal cases, the stramonium has been also employed, and sometimes with advantage, in convulsive and epileptic affections. It is not only taken internally, but has also been used externally. An ointment prepared from the leaves of the stramonium has also been said to give ease in external inflammations and hæmorrhoids.

The inspissated juice of the leaves has been commonly used, but its exhibition requires the greatest caution. At first, one-fourth of a grain is a sufficient dose.

The powder of the leaves or seeds promises to furnish a more certain or convenient formula than the inspissated juice.

According to the late professor Barton, the stramonium is a southern plant, which is gradually diffusing itself, where, a few years since, it was entirely unknown. In 1797, the Doctor adds, he was shown a solitary plant, at Wilkesbarre, in the Wyoming settlement, where it was deemed a great curiosity, and a new-comer. Taken in large quantities, this vegetable sometimes induces tetanus. Dr. Barton mentions the cases of three British soldiers, who ate the stramonium by mistake for lambs-quarters (Chenopodium album.) One became furious and ran about like a madman. A second was seized with genuine tetanus, of which he died. The fate of the third person is not remembered.

Dr. Barton considered the stramonium as a medicine of great and invaluable powers. He began its use, in doses of a few grains, increasing it in a few days to 15 or 20 grains. In one case of mania he gave it to the extent of 60 grains, at a dose. In a case, in which it was exhibited to 30 grains, it dilated the pupil of one eye, and produced palsy of the palpebra of the same, which was removed by a blister.*

Hufeland gave it in the form of a tincture, prepared of two ounces of the seeds in four ounces of wine, and one of diluted alcohol, in diseases of the mind. The inspissated juice of the leaves has been most commonly used ; but its exhibition requires the greatest cau-

* Barton's Medical and Physical Journal, Vol. I. p. 146.—Collections, Part I. p. 46. See also Dr. Cooper's "Inaugural Dissertation on the properties and effects of the Datura Stramonium, &c. Philadelphia: 1797."

tion. At first, a quarter of a grain is a sufficient dose. The bruised leaves, according to Plenck, soften hard and inflamed tumours, and discuss tumours in the breasts of nurses, from indurated milk.

The smoke of the stramonium has lately been much extolled for the cure of asthma. Its use in this manner has been derived from the East Indies, where, however, other species of *datura*, the *fatuosa* and *ferox*, are employed. Dr. Anderson, of Madras, recommended these to General Gent, who made the practice known in Britain, where the stramonium seems first to have been substituted by Mr. Sills. This gentleman received so much benefit from inhaling its smoke, that he published his case in the Monthly Magazine, and recommended it very freely. According to all those who have employed it, it is the root only and the lower part of the stem which is to be used. These are to be dried as quickly as possible, cut into slips, and beat so as to divide the fibres. The manner of using them is by filling the bowl of a tobacco pipe, as with tobacco, and inhaling the smoke. The saliva excited, is directed to be swallowed, but its safety may be considered doubtful. Used in this way, it is however said to excite a sense of heat in the chest, followed by copious expectoration, and sometimes attended with temporary vertigo or drowsiness, and rarely nausea. It frequently gives relief when a pipe is thus smoked upon a paroxysm being threatened, or even after its commencement: the patient falls asleep, and awakes recovered from the paroxysm. In some cases, a perfect cure is effected, but more commonly the relief is only temporary. It seems, however, valuable as a palliative, and the direct application of the remedy to the seat of the disease is rational at least.

Dr. Marcet, of London, has lately spoken well of the stramonium in the Medico-Chirurgical Transactions, vii. p. 551. He used the *extract*, the preparation of which is thus described by Mr. Hudson, of the Hay Market.

"One pound of the *seeds* of stramonium, after being well bruised, are boiled with three gallons of water down to one gallon. The decoction is strained, and the seeds are again boiled, with one gallon more of water, to two quarts. This second decoction is strained, and being mixed with the former, the whole is allowed to stand for twelve hours. The liquor is then drawn off, free from fecula and oil, and evaporated to a proper consistence, the latter part of the evaporation being performed in a water-bath. A considerable portion of oil is separated from the seeds by boiling, which is troublesome in the extract, if allowed to remain, and does not appear to add in any degree to its effect.

"The quantity of extract, yielded by one pound of seeds, is from one ounce and a half to two ounces, being liable to some variation from the state and quality of the seeds.

"An analogous extract is obtained by a process exactly similar, by substituting the *whole plant* cut into small pieces, instead of the seeds; but in this case none of the oily matter above-mentioned ap-

pears. The proportion of extract, when prepared from the whole plant, has not been ascertained."

Dr. Marcet adds, "that from the few comparative trials I have made of the two kinds of preparations, the extract obtained from the seeds has appeared to me considerably more active than that prepared from the whole plant; and the impression made upon my mind from these trials is, that the extract from the seeds is more certain in its effects than the other, and that one part of the former is at least equal in power to two parts of the latter. But though the one appears to be so much stronger than the other, I am not able to point out any other difference between the two preparations."

Dr. Marcet states the result of his experience in the following sentences: "I do not by any means pretend to have yet acquired a competent knowledge of the properties of this medicine: but if I were called upon to express, in a few words, the general opinion which I feel inclined to form from the opportunities I have had of studying them, I should say that the most common effect of stramonium, when administered in appropriate doses,* in cases of chronic disease, attended with acute pain, is to lessen powerfully, and almost immediately, sensibility and pain; to occasion a sort of nervous shock, which is frequently attended with a momentary affection of the head and eyes, with a degree of nausea, and with phænomena resembling those that are produced by intoxication; to excite in many instances nervous sensations, which are referred to the œsophagus, or bronchia, or fauces, and which sometimes amount to a sense of suffocation; to have rather a relaxing than an astringent effect upon the bowels; to have no marked influence upon the frequency of the pulse, though in a few instances it has appeared to render it somewhat slower; to produce but a transitory and inconsiderable dilatation of the iris and pupil; and to have but little immediate tendency to induce sleep, except from the state of comparative serenity and ease, which generally follows the symptoms I have just described." Its use was first suggested to Dr. Marcet by the son of Mr. Norwood, of Ashford, as used by his father.

DECOCTA.—*DECOCTIONS.*

Decoctions differ from infusions only in the action of the menstruum being assisted by a boiling heat. At the same time, however, that the increase of temperature facilitates and expedites the solution of some fixed principles, it gives others a tendency to decomposition, and dissipates all volatile matters. Decoction, therefore, can only be used with advantage for the extraction of principles which are neither volatilized nor altered by a boiling heat.

* I mean from one-eighth to one grain, a dose which should not be exceeded till its effects have been ascertained.

To promote the action of the menstruum, infusion is sometimes premised to decoction.

In compound decoctions it is sometimes convenient not to put in all the ingredients from the first, but in succession, according to their hardness, and the difficulty with which their virtues are extracted; and if any aromatic, or other substances containing volatile principles, enter into the composition, the boiling decoction is to be simply poured upon them, and covered up until cool.

Decoctions should be made in vessels sufficiently large to prevent any risk of boiling over, and should be continued without interruption, and gently.

DECOCTUM ARALIÆ NUDICAULIS. *A.*

Decoction of False Sarsaparilla.

Take of
False sarsaparilla, bruised, . . . six ounces;
Water, ... eight pints.
Digest for four hours, and then boil down to four pints; press out and strain the decoction.

It is somewhat remarkable that the Convention should have here introduced a *problematical* article, as the chief part of a standard formula; for, as has been already noticed, the aralia nudicaulis is only on the secondary list of medicines. Its virtues may be learned by reference to the plant. It is most probable, that in preparing this decoction, all the virtues of the plant would be abstracted either by the four hours' digestion, or the boiling to one half. Certainly there is an unnecessary waste of time and fuel for very little purpose.

DECOCTUM CINCHONÆ. *A. L.*

DECOCTUM CINCHONÆ LANCIFOLIÆ. *E.*

DECOCTUM CORTICIS CINCHONÆ. *D.*

Decoction of (Cinchona) Peruvian Bark.

Take of
Peruvian bark, in powder, . . . one ounce;
Water, ... one pint and a half.
Boil for ten minutes, in a covered vessel, and strain the liquor while hot.

Why the authors of the United States' Pharmacopœia have neglected to inform us of the species of the cinchona we are to employ, we cannot well imagine. The Edinburgh College, whose formula they appear to have followed, mentions the *lance-leaved* cinchona, and so does the London. If it was intended to be optional, this should have been mentioned, as the present plan produces a dilem-

ma, and a want of uniformity; for, if there is a difference in the powers of the three species, there will be the same, probably, in the decoction from them.

Cinchona bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining dissolved; therefore, when a saturated decoction cools, it becomes turbid, and there is always a deposition of a yellowish or reddish powder, while the supernatant liquor is reduced to the strength of a saturated cold infusion. Decoction therefore presents us with an easy means of obtaining immediately an active preparation of cinchona bark, and with one of greater strength than a cold or even a warm infusion, provided it be drunk while tepid, and before it forms any deposition, or if the precipitate be diffused by agitation, after it is formed. As the precipitate contains no woody fibre, or other inert matter, it is extremely probable that in very small doses it would prove, if dried, a very powerful preparation of cinchona bark.

Formerly it was supposed that the strength of a decoction of cinchona bark, and similar substances, was increased by continuing the boiling for a great length of time; but this is now known to be a mistake; and indeed, after a certain time, the decoction becomes weaker instead of stronger, because water at different temperatures is capable of dissolving only a determinate proportion of its active principles; and therefore, as soon as it is saturated, any farther decoction is unnecessary. But moreover, these principles, when dissolved in water, are liable to be decomposed and become inert, by the absorption of atmospheric oxygen, and this decomposition is increased by increase of temperature; and as boiling constantly presents new surfaces to the action of the air, it is evidently hurtful when protracted longer than what is just necessary to saturate the water. Ten minutes are supposed by the colleges to be sufficient for that purpose.

Every purpose for which this decoction is intended, may be equally attained by preparing it as we do the common tea, viz: by adding the *boiling* water to the powdered bark, in a tea-pot, and suffering it to stand till cool.

DECOCTUM COLOMBÆ COMPOSITUM. *A.*

Compound Decoction of Colombo.

Take of
Colombo, bruised,
Quassia, rasped, of each, . . . two drachms;
Orange peel, ... one drachm;
Rhubarb, in powder, ... one scruple;
Carbonat of potass, ... half a drachm;
Water, ... twenty fluid ounces.
Boil to a pint, and add half a fluid ounce of tincture of lavender.

We presume this is a very good tonic, but not superior to that which might be prepared from the *three first* ingredients only. No particular advantage would seem to be anticipated from the addition of the rhubarb and carbonated potash.

DECOCTUM DULCAMARÆ. *A. L.*

Decoction of Bitter Sweet.

Take of
 Bitter sweet, ... one ounce;
 Water, ... one pint and a half.
Boil down to a pint, and strain.

Its use may be learned by referring to *Dulcamara.*

DECOCTUM GUAIACI. *A.*

DECOCTUM GUAIACI COMPOSITUM. *E.*

(*Compound*) *Decoction of Guaiacum. Decoction of the Woods.*

Take of
 Guaiacum wood, rasped, ... three ounces;
 Raisins, stoned, ... two ounces;
 Sassafras, sliced,
 Liquorice, bruised, of each, . . . one ounce;
 Water, ... ten pints.
Boil the guaiacum and raisins in the water, over a gentle fire, down to five pints, adding the roots towards the end of the boiling; then strain the liquor without expression.

This decoction is of use in some rheumatic and cutaneous affections. It may be taken by itself, to the quantity of a quarter of a pint, twice or thrice a day, or used as an assistant in a course of mercurial or antimonial alteratives; the patient in either case, keeping warm, in order to promote the operation of the medicine.

DECOCTUM HORDEI. *A. E. L. D.*

Decoction of Barley. Barley Water.

Take of
 Pearl-barley, two ounces.
Having first washed the barley in cold water, boil it for a short time in about half a pint of water; throw away this water; then pour upon the barley five pints of boiling water; boil it next until half the quantity of the water be evaporated, and afterwards strain it.

DECOCTUM HORDEI COMPOSITUM. *A. L. D.*

Compound Decoction of Barley.

Take of
Decoction of barley, . . . four pints;
Raisins, stoned, ... two ounces;
Figs, sliced, ... two ounces;
Liquorice, bruised, ... half an ounce.
Boil to the consumption of one half of the liquor; first adding the raisins, then the figs, and a short time before the process is finished, the liquorice; lastly strain.

These liquors are to be used freely, as diluting drinks, in fevers and other acute disorders: hence it is of consequence that they should be prepared so as to be as elegant and agreeable as possible; for this reason they are inserted in the pharmacopœia, and the several circumstances which contribute to their elegance set down: if any one of them be omitted, the beverage will be less grateful. However trivial medicines of this class may appear to be, they are of greater importance in the cure of acute diseases than many more elaborate preparations.

Barley water, however, is much more frequently prepared by nurses than apothecaries, particularly in its simple state.

DECOCTUM LICHENIS. *A. E. L. D.*

Decoction of Iceland Moss.

Take of
Iceland moss, . . . one ounce;
Water, ... one pint and a half.
Boil down to a pint, and strain with compression.

As in the present preparation the bitter principle is not removed, it may have some action as a tonic; but it renders it at the same time too nauseous to be used in sufficient quantity to have much effect as an article of diet.

DECOCTUM MEZEREI. *A.*

Decoctum Daphnes Mezerei. *E.* *Decoction of Mezereon.*

Take of
Mezereon, ... two drachms;
Liquorice, bruised, . . . half an ounce;
Water, ... three pints.
Boil with a gentle heat to two pints, and strain.

From four to eight ounces of this decoction may be given four times a day, in some obstinate venereal and rheumatic affections. It operates chiefly by perspiration.

DECOCTUM SARSAPARILLÆ. *A. E. D. L.*

Decoction of Sarsaparilla.

Take of
Sarsaparilla, sliced, . . . six ounces;
Water, ... one gallon.

Digest for two hours, with a heat of about 195; then take out the sarsaparilla, and bruise it; when bruised, put it back into the same liquor, boil down to four pints, then press out and strain the decoction.

Its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing syphilis; but by some it is thought useful in the sequelæ of that disease, and in syphiloïd affections.

DECOCTUM SARSAPARILLÆ COMPOSITUM. *A. D. L.*

Compound Decoction of Sarsaparilla.

Take of
Sarsaparilla, sliced and bruised, . . one ounce and a half;
Guaiacum wood, rasped,
Sassafras,
Liquorice, bruised, of each, ... two drachms;
Mezereon, ... one drachm;
Boiling water, ... three pints.

Digest in the water, with a gentle heat, for six hours, the sarsaparilla, guaiacum, and sassafras; then boil down to one half, adding towards the end of the boiling, the liquorice and mezereon; and strain the liquor.

This compound decoction is an elegant mode of preparing an article once highly celebrated under the title of the Lisbon diet drink, which, for a long time after its first introduction into Britain, was kept a secret; but an account of the method of preparing it was at length published in the Physical and Literary Essays of Edinburgh, by Dr. Donald Monro.

It operates as a diaphoretic, and may be given with advantage in rheumatic cases, and in some of the sequelæ of syphilis. Three or four ounces may be taken four times a day.

DECOCTUM SCILLÆ. *A.* *Decoction of Squill.*

Take of
Squill, ... three drachms;
Juniper, ... four ounces;
Seneca snake root, . three ounces;
Water, ... four pints.
Boil to the consumption of one half the liquor; then strain and add,
Spirit of nitrous ether, four fluid ounces.

The lists of Materia Medica of the United States' Pharmacopœia, contain two *junipers;* we are not told which to take, but presume it to be the J. communis.

We cannot omit to add, that the name given to this decoction seems very illy chosen, since the article which gives the name is only the one-eighteenth part of the amount of the two other ingredients. Its powers depend principally, we should conceive, on the seneca and the sweet spirit of nitre.

DECOCTUM SENEGÆ. *A. L. E.*

Decoction of Seneca Snake Root.

Take of
Seneca snake root, . . . one ounce;
Water, ... two pints.
Boil down to a pint, and strain.

The virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydropic cases, and rheumatic or arthritic complaints, is two ounces, three or four times a day, according to its effect. It is recommended in affections of the lungs, attended with debility, and inordinate secretion.

It will readily be perceived, that this decoction is superior in strength to the preceding, at least in respect to the seneca.

DECOCTUM VERATRI. *A. L.*

Decoction of White Hellebore.

Take of
White hellebore, powdered, . . one ounce;
Water, ... two pints;
Alcohol, ... two fluid ounces.
Boil the hellebore in the water down to a pint, and strain the decoction; then after it has cooled, add the alcohol.

This decoction is only used externally as a wash in tinea capitis, lepra, psora, &c. When the skin is very tender, it should be diluted with an equal quantity of water.

Decoctum Althææ Officinalis. *E.*

Decoction of Marsh Mallows.

Take of
Dried marshmallow roots, . . . four ounces;
Raisins of the sun, stoned, . . two ounces;
Water, ... seven pounds.
Boil to five pounds; place apart the strained liquor till the feces have subsided, then pour off the clear liquor.

Marshmallow roots contain nothing soluble in water except mucilage, which is very abundant in them. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

Decoctum Chamæmeli. *E. D.* Decoctum pro Fomenti. *L.*

Decoction of Camomile. Decoction for Fomentations.

Take of
The leaves of southernwood, dried,
The tops of sea-wormwood, dried,
Chamomile flowers, dried, each . . . one ounce;
Bay leaves, dried, ... half an ounce;
Distilled water, ... six pints.
Boil them a little, and strain.

This decoction is merely a solution of bitter extractive, combined with essential oils. In making it, the aromatic substances should not be added until the decoction is nearly completed; for otherwise their flavour would be entirely dissipated.

It must, however, be acknowledged, that these impregnations are for the most part unnecessary for the purpose of clysters; and in ordinary cases, the bulk and warmth produce a discharge before these medicines can have any effect.

As fomentations, their virtues are also in a great measure to be ascribed to the influence of the warm water: and when the herbs themselves are applied, they act only as retaining heat and moisture for a longer time.

Decoctum Digitalis. *D.* *Decoction of Foxglove.*

Take of
Foxglove leaves, dried, ... one drachm;
Water, as much as will furnish a strained decoction of eight ounces, by measure.
Place the vessel upon a slow fire, and as soon as the liquor boils, remove it. Digest for a quarter of an hour, and strain.

This decoction, according to the proportion employed, is twenty times weaker than that so much praised by Dr. Darwin; but with a medicine of such great activity, it is an advantage to be able to regulate the doses easily; aud it is probable that the strength of decoctions is not increased in proportion as the quantity of the menstruum is diminished.

Decoctum Geoffrææ Inermis. *E.*

Decoction of Cabbage Tree Bark.

Take of
Bark of the cabbage-tree, powdered, . . . one ounce;
Water, ... two pounds.
Boil it with a gentle fire down to one pound, and strain. *E.*

This is a powerful anthelmintic. It may be given in doses of one table-spoonful to children, and four to adults. If disagreeable symptoms should arise from an over-dose, or from drinking cold water during its action, we must immediately purge with castor-oil, and dilute with acidulated drinks.

Decoctum Ulmi. *E. L. D.* *Decoction of Elm.*

Take of
The fresh inner bark of elm, bruised, . . . four ounces;
Water, ... four pints.
Boil to two pints, and strain. *L.*

Under this form, the elm bark has been employed for combating those cutaneous eruptions, against which it has of late been so highly celebrated. Experience, however, in actual practice, by no means confirms the very favourable account which some have given of its use.

We freely confess we think this numerous list of decoctions, better adapted to the meridian of a sick chamber, as extemporaneous prescriptions, than as the regular formulæ of a standard Pharmacopœia, and we should be glad to see them removed altogether, or with exceptions, from our compounds.

DELPHINIUM. *A.* (*Secondary.*) *Larkspur.* *The Root.*

Delphinium Staphisagria. *L. D. Stavesacre. The Seed.*

Stavesacre is a biennial plant, a native of the south of Europe. The seeds are usually brought from Italy. They are large and rough, of an irregular triangular figure, of a blackish colour on the outside, and yellowish or whitish within; they have a disagreeable smell, and a very nauseous, bitterish, burning taste.

Neumann got from 480 parts, 45 alcoholic extract, besides 90 of fixed oil, which separated during the process, and afterwards 44 insipid watery, and inversely 95 watery, and then by alcohol only one, besides 71 of oil.

Medical use.—Stavesacre was employed by the ancients as a cathartic; but it operates with so much violence, both upwards and downwards, that its internal use has been, among the generality of practitioners, for some time laid aside. It is chiefly employed in external applications for some kinds of cutaneous eruptions, and for destroying lice and other insects; insomuch, that from this virtue it has received its name, in different languages.

DIANTHUS CARYOPHYLLUS. *E. D.*

Clove Gilly-flower. Clove Pink or Carnation. The Flowers.

This species of dianthus is a native of Italy, and is perennial. By cultivation, its varieties have increased to a very great number, and they form one of the greatest ornaments of our gardens. Most of these are termed carnations, but the variety which is officinal, surpasses all the others in the richness of its smell, and is also distinguished by its colour, being of a uniform deep crimson. Their only use in pharmacy is to give a pleasant flavour and beautiful colour to an officinal syrup.

DIGITALIS. *A.* Digitalis Purpurea. *E. L. D.*

Foxglove. The Leaves.

Didynamia Angiospermia.—Nat. ord. *Solanaceæ.*

This is an European biennial plant, very common on hedge-banks, and sides of hills, in dry, gravelly, or sandy soils, and the beauty of its appearance has gained it a place in our gardens and shrubberies. The leaves are large, oblong, egg-shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony. Destouches analysed foxglove. Four ounces of the dried leaves yielded successively 9 drachms of watery, and 78 grains of alcoholic extract. The first was brown, smooth, and of a consis-

tence fit for making pills. The second had a very deep green colour, a virose and disagreeable smell, the consistence of tallow, but more tenacious; did not furnish ammonia by distillation, and was not acted upon by acids. The ashes contained salts of lime and potass.

Medical use.—Its effects when swallowed are,

1. To diminish the frequency of the pulse.
2. To diminish the irritability of the system.
3. To increase the action of the absorbents.
4. To increase the discharge by urine.

In excessive doses, it produces vomiting, purging, dimness of sight, vertigo, delirium, hiccough, convulsions, collapse, death. For these symptoms the best remedies are cordials and stimulants.

Internally, digitalis has been recommended,

1. In inflammatory diseases, from its very remarkable power of diminishing the velocity of the circulation.

2. In active hemorrhagies, in phthisis.

3. In some spasmodic affections, as in spasmodic asthma, palpitation, &c.

4. In mania from effusion on the brain.

5. In anasarcous and dropsical effusions.

6. In scrofulous tumours.

7. In aneurisms of the aorta, it has alleviated the most distressing symptoms.

Externally, it has been applied to scrofulous tumours.

It may be exhibited,

1. In substance, either by itself, or conjoined with some aromatic, or made into pills with soap or gum ammoniac. Withering directs the leaves to be gathered after the flowering stem has shot up, and about the time when the blossoms are coming forth. He rejects the leaf-stalk, and middle rib of the leaves, and dries the remaining part either in the sunshine or before the fire. In this state they are easily reduced to a beautiful green powder, of which we may give at first one grain twice a-day, and gradually increase the dose until it act upon the kidneys, stomach, pulse, and bowels, when its use must be laid aside or suspended.

2. In infusion. The same author directs a drachm of the dried leaves to be infused for four hours in eight ounces of boiling water, and that there be added to the strained liquor an ounce of any spirituous water, for its preservation. Half an ounce, or an ounce of this infusion, may be given twice a-day.

3. In decoction. Darwin directs that four ounces of the fresh leaves be boiled from two pounds of water to one, and half an ounce of the strained decoction be taken every two hours, for four or more doses.

4. In tincture. Put one ounce of the dried leaves coarsely powdered into four ounces of diluted alcohol; let the mixture stand by the fireside twenty-four hours, frequently shaking the bottle; and the saturated tincture, as Darwin calls it, must then be separated

from the residuum by straining or decantation. Twenty drops of this tincture may be taken twice or thrice a-day. The Edinburgh college use eight ounces of diluted alcohol to one of the powder, but let it digest seven days. A tincture of the flowers is said by Dr. Barton to be equally or more powerful.

5. The expressed juice and extract are not proper forms of exhibiting this very active remedy.

When the digitalis is disposed to excite looseness, opium may be advantageously conjoined with it; and when the bowels are tardy, jalap may be given at the same time, without interfering with its diuretic effects. During its operation in this way, the patient should drink very freely. An ointment of the flowers is said to have been useful in scrofulous ulcers.

In a letter from Dr. Gregg to Dr. Walmsley, published in the Philadelphia Medical and Physical Journal, two cases of phthisis are mentioned, in which this remedy induced a copious ptyalism, which lasted some time, but without producing any beneficial effect. In the second case, the ptyalism was a second time induced by its use.

There is a singular anomaly attending the operation of foxglove noticed by a writer in the third volume of the Edinburgh Medical Journal, and also by Dr. Hamilton in his treatise on digitalis, and some others, which appears to merit attention in its administration. That its action is considerably influenced by the different positions of the patient's body, whether erect or recumbent. In one case of phthisis, after taking this medicine, the pulse was not lessened in frequency when the patient stood erect, being 120. When he sat down it fell to 70, and when lying on his back it fell to 40. The experiment was repeated many times, and always with the same effect.

As this plant is a very beautiful addition to the garden, and by no means difficult to raise, it would be very desirable, to insure the advantages expected from it, that medical men should cultivate it themselves.* The leaves from the second year's growth, are supposed by some to be superior in efficacy.

DIOSPYROS. *A.* (*Secondary.*) Diospyros Virginiana.

Persimmon. The Bark.

Polygamia Diœcia. Linnæus.

According to Michaux, the forty-second degree of latitude is the northern boundary of this tree. It abounds in the middle states, and in the western forests; varying greatly in size, from soil and climate. In the most favourable situation it reaches sixty feet in height, and

* Disappointment more probably ensues, from other plants being mistaken for Digitalis. Cox, in his treatise on Insanity, speaks of the apothecaries drying *mullein* leaves for it. And a species of Cynoglossum has likewise been used for it.

eighteen or twenty inches in diameter. The fruit, which is only edible after frost, is sometimes formed into cakes with bran, which being dried in an oven, are kept to make beer. Bruised in water, fermentation follows, and by distillation, this liquor affords brandy.

The inner bark is extremely bitter, and is said by Breckel, in his history of North Carolina, to have been used successfully in intermittents. The late Professor Barton used it in ulcerous sore throat; and the ripe fruit has been said to be useful in the worm cases of children.*

DIRCA PALUSTRIS. *Lin.* *Moose-wood.* *Leather-wood.*

The bark of this plant is said to produce a blister. It is allied to the genus daphne, all the species of which are blisters.†

DOLICHOS. *A. E. L. D.*

DOLICHOS PRURIENS. STIZOLOBIUM.

Cow-itch. Cowhage. The bristles of the Pods.

The dolichos is a climbing plant, resembling our common scarlet runner, growing in great abundance in warm climates, particularly in the West Indies. The pods are about four inches long, round, and as thick as a man's finger. On the outside they are thickly beset with stiff brown hairs, which, when applied to the skin, occasion a most intolerable itching. In the choice of cow-itch, we must reject all those pods which are shrivelled, brown, and diminutive in size, which have lain long in damp warehouses, and are musty, or of a bad colour.

Medical use.—The ripe pods are dipped in syrup, which is again scraped off with a knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically as an anthelmintic, occasions no uneasiness in the primæ viæ, and may be safely taken, from a tea-spoonful to a table-spoonful in the morning, fasting. The worms are said to appear with the second or third dose ; and by means of a purge, in some cases the stools have consisted entirely of worms. For further information, the publications of Mr. Chamberlayne may be consulted, or the Philadelphia Medical Museum.

It is a perfectly safe and a very excellent vermifuge; and the plant might probably be usefully cultivated in the United States.

* Barton's Collections. See also Professor Woodhouse's Inaugural Dissertation on this subject.

† Barton's Collections.

DRACONTIUM. *A.*

DRACONTIUM FŒTIDUM. *Willd.* ICTODES FŒTIDUS. *Bigl.*

SYMPLOCARPUS FŒTIDUS. *Bart.* POTHOS FŒTIDA.

Skunk Cabbage. The Root.

There seems much difference of sentiment as to the proper denomination of this plant, as may appear by reference to the synonimes above, and still more by the publications of Drs. Bigelow and Barton. Its very offensive smell, strongly allied to that of the skunk, has led to its employment as an antispasmodic; and it is probably equal in this respect to most of the class. Dr. Cutler recommends it strongly in asthma, and it has been also much celebrated in catarrh and chronic coughs, in hysteria, dropsy, and rheumatism, and even in epilepsy.

Its activity seems dependent on a volatile principle, which is impaired by long keeping, especially in powder. It is best, therefore, to keep it in slices, and not powder it until wanted. It is given in pills, or mixed with syrup, in doses of ten to twenty grains, two or three times a-day. It has, we think, been introduced among the *standard* articles of the Materia Medica, by the Pharmacopœia of the United States, rather prematurely, as its employment hitherto has been too limited to speak with perfect confidence of its medicinal powers.

DULCAMARA. *A.* SOLANUM DULCAMARA. *L. D.*

Bitter-Sweet. Woody Nightshade. The Twigs.

This climbing plant grows wild in moist hedges, has woody brittle stalks, and climbs on the bushes. The taste of the twigs and roots, as the name of the plant expresses, is both bitter and sweet; the bitterness being first perceived, and the sweetness afterwards. They have a nauseous smell when fresh.

Medical use.—The dulcamara was formerly much esteemed as a powerful medicine. It is in general said to increase all the secretions and excretions, to excite the heart and arteries, and, in large doses, to produce nausea, vomiting and convulsions; but its effects seem to differ according to the nature of the soil on which it grows, being most efficacious in warm climates, and on dry soils. It has been recommended in cutaneous affections, especially lepra, and in syphiloid diseases, in rheumatic and cachectic swellings, in ill-conditioned ulcers, scrofula, indurations from milk, leucorrhœa, jaundice, and obstructed menstruation. It has principally been used in decoction: two or three ounces of that of the London Pharmacopœia

may be given thrice a-day, and gradually augmented, till a pint be consumed daily. A stronger decoction may be used externally as a lotion. In the form of extract, from 5 to 10 grains may be given for a dose.

E.

ELATERIUM. *A. E. L. D.*

Wild or squirting Cucumber. Its inspissated Juice.

The Extract of the Fruit.

The plant from which this medicine is procured, is a native of the South of Europe, and is perennial. When cultivated in Great Britain, it does not survive the winter. The fruit is oblong, about an inch and a half long, and an inch in diameter. It is of a green colour, and beset with stiff hairs. When nearly ripe, it bursts on a slight touch, separates from its stalk, and sheds its seeds with great violence. From this circumstance, it was named by the Greeks *Elaterium*, which name was also applied to the fécula of the juice of the fruit, the only preparation used in medicine. Planche found it to contain animo-vegetable matter.

Medical use.—In a few grains it operates as a drastic purgative, and is sometimes used in dropsies. It is high priced and seldom used, though lately recommended by Dr. Ferriar.

The mode in which the extract, fecula, or inspissated juice is obtained from the cucumber, is as follows:

Slice ripe wild cucumbers, and pass the juice, very lightly expressed, through a very fine hair sieve, into a glass vessel, then boil a little, and set it by some hours until the thicker part has subsided. Pour off the thinner part swimming at the top, and separate the rest by filtering. Cover the thicker part, which remains after filtration, with a linen cloth, and dry it with a gentle heat. *E.*

This is not properly an inspissated juice, but a deposition from the expressed juice. Such depositions have long been called Fecula, and the denomination has been confirmed in modern times. Its application, however, appears to be too extended; for fecula is applied both to mild and nutritious substances, such as starch, and to drastic substances, such as that of which we are now treating. Besides, if it possessed exactly the same chemical properties as starch, it would be converted into a gelatinous mass by the boiling directed by the Edinburgh college, and would not separate; whereas, the boiling is intended to promote the separation.

The filtration above directed, for draining off such part of the

watery fluid as cannot be separated by decantation, is not the common filtration through paper, for this does not succeed here: the grosser parts of the juice, falling to the bottom, form a viscid cake upon the paper which the liquid cannot pass through. The separation is to be attempted in another manner, by draining the fluid from the top. This is effected by placing one end of some moistened strips of woollen cloth, skeins of cotton, or the like, in the juice, and laying the other end over the edge of the vessel, so as to hang down lower than the surface of the liquor, by this management the separation succeeds in perfection.

Medical use.—Elaterium is a very violent hydragogue cathartic. In general, previous to its operation, it excites considerable sickness at the stomach, and not unfrequently it produces severe vomiting. Hence it is seldom employed till other remedies have been tried in vain. But in some instances of ascites it will produce a complete evacuation of water, where other cathartics have had no effect. Two or three grains are in general a sufficient dose. And perhaps the best mode of exhibiting it is by giving it only to the extent of half a grain at a time, and repeating that dose every hour till it begins to operate.

The framers of the United States' Pharmacopœia, although they have admitted this powerful article into the catalogue of the Materia Medica, have been at no pains to inform us how it ought to be prepared: yet its efficacy, in a great measure, is dependent on the care with which this is effected; and as it is not as yet domesticated among us, a person desirous of obtaining the medicinal preparation would be at a loss, if depending on the Pharmacopœia solely.

From the testimony of Dioscorides, and others, the elaterium was employed with much confidence and success by the ancients; they do not, however, seem to have had any accurate notions of the part to which its purgative property was due; all of it, leaves, root and fruit, were supposed to possess it; and the very contradictory evidence of its powers, was also dependent on the same want of information in this particular. The late ingenious experiments of Dr. Clutterbuck, have settled this question;* and they have been fully confirmed by the still later experiments of Dr. Paris. As this is an important subject, it is thought proper to extract the whole of the remarks of the last named gentleman, as his work is not in common use.

"Extractum Elaterii. *L.*

"This substance spontaneously subsides from the juice of the wild cucumber, in consequence, I presume, of one of those series of changes which vegetable matter is perpetually undergoing, although we are hitherto unable to express them by any known chemical law. It is therefore not an *extract*, either in the chemical or pharmaceutical acceptation of the term, nor an *inspissated juice*, nor is it a *fe-*

* London Medical Repository, vol. 12, or Eclectic Repertory, vol. 10.

*cula,** as it has been termed; the Dublin College has perhaps been most correct in simply calling it *Elaterium*, the name given to it by Dioscorides.

"It occurs in commerce in little thin cakes or broken pieces, bearing the impression of the muslin upon which it has been dried; its *colour* is greenish, its *taste* bitter, and somewhat acrid; and when tolerably pure, it is light, pulverulent, and inflammable.

"The early history of this medicinal substance is involved in great perplexity, each author speaking of a different preparation by the same name; for instance, the *Elaterium* of Dioscorides must have been a very different substance from that of *Theophrastus*; and, wherever Hippocrates mentions the term, he evidently alludes to *any* violent purgative. "*Hippocrati Elaterium medicamentum est quod per alvum expurgat.*" (*Bod. in Theophrast.*) This will, in some degree, reconcile the discordant testimonies of different authors, with regard to the powers of *elaterium;* for example, Dioscorides states its dose to be from grs. ii to ℈j—in Ætius, Paulus, and Actuarius, it is recommended to the extent of ʒss—in Mesue from ℈ss to to ℈j—in Bontius (*Med. Ind.*) from ℈j to ʒss—Massarias exhibits it in doses of grs. vj—Fernelius and Senneretus to ℈j—Herman from grs. v to vij—Quincy to grs. v—and Boerhaave does not venture to give more than grs. iv—and the practitioners of the present day limit their dose from gr. ½ to grs. ij. Dr. Clutterbuck, with a laudable intention to discover some method of procuring this article at a cheaper rate, and at the same time of discovering some process which might ensure a preparation of more uniform strength, has lately performed a series of interesting and instructive experiments,† the results of which prove in a satisfactory manner "that the active principle of this plant is neither lodged in the roots, leaves, flowers, nor stalks, in *any considerable quantity;* nor is it to be found in the body of the fruit itself, or in the seeds, but in *the juice around the seeds;* the substance which spontaneously subsides from this liquor, obtained without pressure, is *genuine* elaterium, the quantity of which, contained in the fruit, is extremely small, for Dr. Clutterbuck obtained only six grains from *forty* cucumbers. This gentleman communicated the detail of these experiments to the President of the College of Physicians, who requested me to report upon them. I accordingly deemed it to be my duty to enter upon a series of new experiments, which I have lately completed, with the able assistance of Mr. Farraday, in the laboratory of the Royal Institution. The results of which will show, that, although Dr. Clutterbuck found that an *eighth* part of a grain of elaterium seldom failed to *purge violently*, yet, strange as it may appear, *not more than one grain in ten* of elaterium, as it occurs in com-

* The juices of *iris root, arum root*, and *bryony root*, and those of many other plants, allow their medicinal elements to separate and subside in a similar manner, leaving the supernatant liquid perfectly inert; if we must have a generic name to express such substances, it should be termed a *feculence*, rather than a *fecula*.

† "*Observations on the Nature and Preparation of the Elaterium,*" read at the Medical Society of London, April 24, 1819, and which were published in the Medical Repository, vol. xii. No. 67.

merce, possesses any active properties, and that this decimal part is a vegetable proximate principle, not hitherto noticed, to which I shall give the name of ELATIN. I shall subjoin the detail of my experiments, and I think it will appear, that their results will authorise me to express the chemical composition of elaterium in the following manner.

Water	·4
Extractive	2·6
Fecula	2·8
Gluten	·5
Woody matter	2·5
Elatin	} 1·2
Bitter Principle	
	10 grains.

PROXIMATE ANALYSIS OF ELATERIUM.

Experiments. Series 1st.

A.

"Ten grains of elaterium, obtained from a respectable chemist, and having all the sensible properties which indicated it to be genuine, were digested for twenty-four hours with distilled water, at a temperature far below that of boiling; *four grains* only were dissolved.

B.

"The solution was intensely bitter, of a brownish yellow colour, and was not in the least disturbed by alcohol, although a solution of *iodine* produced a blue colour; the solution therefore contained no gum, and only *slight traces* of starch.

C.

"The solution, after standing twenty-four hours, yielded a *pellicle* of insoluble matter, which when burnt appeared to resemble *gluten*.

D.

"The six grains which were insoluble in water, were treated for forty-eight hours with alcohol of the specific gravity .817, at 66° of *Fahrenheit*; a green solution was obtained, but by slow evaporation *only half a grain* of solid green matter was procured. The insoluble residue obstinately adhered to, and coated the filtre like a varnish, and completely defended the mass from the action of the alcohol; it is probable that it consisted principally of *fecula*.

Experiments. Series 2d.

E.

"Ten grains of Elaterium, from the same sample, were treated with alcohol of the specific gravity .817, at 66°. *Fah.* for twenty-four hours; upon being filtered, and the residuum washed with successive portions of alcohol, the elaterium was found to have lost only 1.6 of a grain. The high specific gravity of the alcohol in this experiment, was important, had it been lower, different results would have been produced.

F.

"The alcoholic solution obtained in the last experiment, was of a most brilliant and beautiful green colour, resembling that of the oil of cajeput, but brighter; upon slowly evaporating it, 1.2 grains of solid green matter was obtained.

G.

"The solid green matter of the last experiment was treated with boiling distilled water, when a minute portion was thus dissolved, and a solution of a most intensely bitter taste, and of a brownish yellow colour, resulted.

H.

"The residue, insoluble in water, was inflammable, burning with smoke, and an aromatic odour, not in the least bitter; it was soluble in alkalies, and was again precipitated from them unchanged in colour; it formed, with pure alcohol, a beautiful tincture, which yielded an odour of a very nauseous kind, but of very little flavour,

and which gave a precipitate with water; it was soft, and of considerable specific gravity, sinking rapidly in water; circumstances which distinguish it from common resin; in very minute quantities it purges. It appears to be the element in which the purgative powers of the elaterium are concentrated, and which I have denominated ELATIN.

I.

"The residuum, insoluble in alcohol, weighing 8.4 grs. (*Expt.* E.) was boiled in double distilled water, when 5.9 grs. were dissolved.

J.

"The above solution was copiously precipitated *blue* by a solution of *iodine*, and scarcely disturbed by the *per-sulphat of iron.*

K.

"The part insoluble, both in alcohol and water, which was left after experiment I., amounted to 2.5 grains; it burnt like wood, and was insoluble in alkalies.

"It appears that the whole of the *elatin* does not separate itself from its native juice by spontaneous subsidence, and that, on this account, the supernatant liquor possesses some powers as a cathartic. We cannot be surprised, therefore, that the elaterium of commerce should be a very variable and uncertain medicine; for, independent of the great temptation which its high price holds out for adulterating it, which is frequently done with starch, it necessarily follows, that where the active principle of a compound bears so small a proportion to its bulk, it is liable to be affected by the slightest variation in the process for its preparation, and even by the temperature of the season; where pressure is used for obtaining the juices, a greater or less quantity of the inactive parts of the cucumber will be mixed with the *elatin,* in proportion to the extent of such pressure, and the *elaterium* will of course be proportionally weak.* There is one curious result obtained in my experiments which deserves notice, *viz.* that there is a *bitter* principle in the elaterium, very distinct from its extractive matter, and totally unconnected with its activity, for I diluted the solution obtained in experiment G, and swallowed it, but it produced upon me no effect, except that which I generally experience upon taking a powerful bitter—an increased appetite; and yet, notwithstanding this fact, when in combination with *elatin,* it is far from being inert, since this latter body is considerably quickened by its presence.—The solution B was given to a person, but no effect whatever ensued. *Dose* of good elaterium, as it occurs in commerce, is about two grains, or it is better to give it only to the extent of a half a grain at a time, and to repeat that dose every hour until it begins to operate, It is probably, when thus managed, the best hydragogue cathartic which we possess; it differs, however, from the

* When it has a dark green colour, approaching to black, is compact, and very heavy, and breaks with a shining resinous fracture, we may reject it as an inferior article.

Since the publication of my experiments upon the ordinary elaterium of commerce, I have been favoured by Mr. Barry, with the results of his trials upon the elaterium made by W. Allen & Co. according to the improved process of Dr. Clutterbuck; of the first sample, he found that out of ten grains, 5·5 were soluble in spirit of the specific gravity 809, of the second 6·2, and of the third 6·4; of that prepared by the same process at Apothecaries' Hall, 6 grains were soluble. The residue, insoluble in the spirit, was administered to a patient, and ascertained to be perfectly inert. This report confirms beyond a doubt the great superiority of the elaterium when prepared, *without pressure,* according to the suggestion of Dr. Clutterbuck.

class of remedies to which it belongs, for it excites the pulse and whole animal system, so as to produce a considerable degree of febrile action. It was strongly recommended by Sydenham, Lister, and Hoffman, and all their cotemporaries and immediate successors, as a valuable remedy in dropsy, but in consequence of some fatal results from its improper application, it was driven from practice with a violence that marks prejudice rather than conviction; one author in descanting upon its virulence, exclaims "*Elaterium esse in catalogo diaboli quo necat homines.*"

ELECTRICITAS. *Electricity.*

When we consider the great activity of the electric fluid, and the important agency it exercises in the operations of nature, we cannot be surprised that its first discovery should have been hailed as leading to a vast accession in the healing art. So exaggerated however, were the encomiums bestowed upon it, by those who first advanced its claims to a standing as a means of cure, that, subsequent experience not verifying it, it sank into unmerited disuse. In the first accounts of Mussenbroeck of the effects of the Leyden vial, surprise and terror usurped the place of judgment; and led a man of the most philosophic and candid character to give to Reaumur such a detail of its power, that we are lost in astonishment at the effects of the imagination.

Electrifying a glass of water, and attempting to take a spark from the chain still left in the water, the glass being held in the hand, a shock was experienced; Mussenbroeck assures Reaumur, "qu'il fut tellement frappé sur les bras, sur les épaules et dans la poitrine, qu'il en perdit la respiration, et qu'il fut plus de deux jours avant de revenir des effets du coup et de la frayeur; et lorsqu'il il ajoute qu'il ne voudroit pas la répéter une seconde fois *pour la couronne de France.*"—*Sigaud de la Fond, précis d'Electricité.*—212.

The first effects of almost every important remedy, have generally been overrated; and it requires time for the real character of the article to be duly estimated. Except in the hands of a few medical electricians, the powerful energy of this wonderful agent appears still to be unknown to the generality of physicians. The details, however, given in various volumes of the Philosophical Transactions of Great Britain; in the treatises on Electricity, by Adams, by Birch, Cavallo, Cuthbertson and others, are amply sufficient to demonstrate its importance in the healing art. To those treatises the reader is referred as affording the best evidence that we are too neglectful of its benefits.

From them we learn that it has been successfully employed in rheumatism, deafness, toothache, swellings and inflammations of different parts, in gutta serena, fistula lacrymalis, paralysis, hemiplegia, ulcers, eruptions, chorea, scrofula, abscesses, nervous headaches, dropsy, gout, intermittents, suppression of the menstrual dis-

charge, and several other forms of diseased action. Cases are particularly detailed of most of these, by which the reader will be enabled to draw his own deductions. In the United States, we are not altogether deficient in similar proofs. Mr. Tucker, of this city, has been very successful in relieving many persons by the means of Electricity; and we would hope that more attention will be in future bestowed by regular practitioners to the employment of this powerful agent. The best means of regulating its use, may be acquired by reference to the authors abovementioned. We have considered it proper to direct the attention of practitioners once more to a nearly obsolete practice.

ERIGERON CANADENSE. *A.* (*Secondary.*)

Canada Flea-bane. The Plant.

What the particular virtues of this plant are, which caused its introduction into the secondary list of the United States' Pharmacopœia, I know not. It is not noticed by either Professors Bigelow or Barton. It is, however, probably allied in virtues to the following.

ERIGERON PHILADELPHICUM. *A.* (*Secondary.*)

Scabious. Skevish. Philadelphia Flea-bane. The Plant.

This is one of the most common plants in many parts of the United States. It has been used in decoction or infusion in Philadelphia, for gouty and gravelly complaints, and in some instances with much benefit. It operates powerfully as a diuretic and sudorific. It is known by the name of Skevish, in Pennsylvania, which Dr. Barton suspects to be a corruption of the word Scabious. This plant is employed by the Cochin-Chinese, according to Father Lureiro; who speaks of it as an active emmenagogue.*

ERYNGIUM AQUATICUM. *A.* (*Secondary.*)

Water Eryngo. Button Snake Root. The Root.

This plant is nearly allied to the contrayerva of the shops, und acts more especially as a sudorific. It is used in decoction by the southern Indians.†

* Barton's Collections, Part II. p. 46. † Barton's Collections, Part I. p. 20.

Eryngium Maritimum. *D.*

Sea Holly. Sea Eryngo. The Root.

This plant grows plentifully on some of the sandy and gravelly shores of Great Britain: the roots are slender, and very long; of a pleasant sweetish taste, which, on chewing them for some time, is followed by a slight degree of aromatic warmth and acrimony. They are accounted aperient and diuretic, and have also been celebrated as aphrodisiac: their virtues, however, are too weak to admit them under the head of medicines.

ERYTHRONIUM AMERICANUM. *A.* (*Secondary.*)

Common Erythronium. The Plant.

From all I can learn of this plant, it seems better calculated to afford a supply of farinaceous aliment, than of an active medicine; for although in its green, or recently dried state, it acts as an emetic in doses of twenty five to forty grains; yet when fully and thoroughly dried, and when exposed to heat, it appears to lose this property. I cannot well see why it is added to our list of supernumeraries.

EUPATORIUM AYA-PAYNA.

This plant has of late excited attention amongst the French physicans, through the means of Captain Augustin Baudin, by whom it was carried from Brazil to the Isle of France. In Brazil it has received the name of the *miraculous plant*, from its many real or attributed virtues in the cure of disease.

This plant is particularly described by Mr. De Ventenat, in his superb work, entitled "Le Jardin de la Malmaison." He refers it to the genus Eupatorium. It belongs to the Corymbiferæ of Jussieu, and to the Polygamia æqualis of Linnæus. It grows plentifully on the river of Amazons, and is easily propagated by slips. It is reputed to be an alexipharmic, emmenagogue, diaphoretic, &c. It is also said to possess lithontriptic virtues. It is chiefly on account of its first mentioned property that it is so highly esteemed by the South Americans; in confirmation of which, numerous well authenticated cases have been published. In two cases, the one of the sting of a scorpion, the other from the prick of the fish called the *Last*, in fishing, both detailed in the Colonial Gazette, the application of the pounded leaves to the wounded parts, speedily removed the pain and inflammation, and the persons were soon restored. The latter case is

particularly remarkable, since it is said so dangerous is the wound of the Last, and so generally considered as mortal, that the only remedy hitherto employed was excision or amputation.

It has been successfully employed as a diuretic in ascites ; and is eminently useful in rheumatism and in gout. Its external application produces redness and inflammation.

As yet we know too little of this plant to credit the high encomiums bestowed upon it; yet they are fully sufficient to induce a wish to see the plant naturalized amongst us; and it is to be hoped that by the intermedium of our captains or physicians who visit Brazil, the Aya-Payna may not be long a stranger to us.

EUPATORIUM PERFOLIATUM. *A.*

Thoroughwort. The Herb.

This plant is known by the name of Thorough-stem, Cross-wort, Bone-set, and Indian sage. It is one of the remedies of the Indians; and acts powerfully as a sudorific and emetic, and has been successfully employed in intermittents and other fevers, either in decoction, or the leaves in powder. The *aya-payna*, so celebrated of late, is a species of the same family. Every part of the eupatorium may be advantageously employed, though the flowers appear most active. A watery infusion of the leaves is a powerful and not disagreeable bitter, and the flowers are deemed superior in this respect to those of the anthemis nobilis, by Dr. Barton.*

This is a native annual plant, flourishing abundantly in wet meadows and other moist places. The stalk is hairy and rises from two to four feet, perforating the leaves at each joint, from which it is sometimes called thorough stalk or stem. The flowers are white and appear in July and August, forming a corymbus, at the termination of the branches. The leaves at each joint are horizontal, serrated and rough, from three to four inches long, and about an inch broad at their base, gradually lessening to a very acute point, of dark green, and covered with short hairs. Thoroughwort certainly possesses active properties, and deserves the attention of American physicians. It acts powerfully as a sudorific and emetic, and sometimes as a purgative, and has been successfully employed in intermittents and other fevers, either in decoction or the leaves in powder. Every part of the plant may be advantageously employed, though the flowers appear most active. A watery infusion of the leaves is a powerful and not disagreeable bitter, and the flowers are deemed superior in this respect to those of chamomile, and ought to be kept in the shops. The dried leaves in powder, or made into pills with lenitive electuary, given in doses of twelve or fifteen grains, are of excellent effect as a mild laxative, obviating costiveness without inducing debility or heat ; correcting bile and promoting perspiration. This plant is frequently employed in the country as a drench in diseases of cattle. There are several species in the United States.

* Barton's Collections, Part I. p. 52. Part II. p. 22.

According to the experiments of Dr. A. Anderson of New York, this plant contains, firstly, a free acid; secondly, tannin; thirdly, extractive matter; fourthly, a gummy matter; fifthly, a resin; sixthly, azote; seventhly, lime, probably the acetat of lime; eighthly, gallic acid, probably modified; ninthly, a resiniform matter, soluble in water and alcohol, and which seems to contain a bitter principle. Hence he deems it warrantable to conclude that this plant possesses active medicinal properties; that many of them are similar to those which characterize the cinchona officinalis, the anthemis nobilis, and other valuable articles of the materia medica; but that these virtues reside in greatest quantity in the *leaves*.

As pharmaceutical preparations of this plant, the author recommends the decoction of the flowers and of the leaves; infusions of the same parts; the leaves in substance pulverized; and a tincture of the flowers and of the leaves, prepared with proof spirits. This last form is the most pleasant and convenient, and at the same time the most powerful, for proof spirits were ascertained to be the best menstruum. Our author does not hesitate to assert that the chemical properties of E. Perfoliatum, as deduced from experiment, are in very many respects exactly similar to the Peruvian bark; and that for its active medicinal virtues, particularly as a sudorific and as a tonic, it will not suffer by comparison with any of the articles drawn from the vegetable kingdom. In addition to his own opportunities of witnessing the employment of this plant, in different diseases in the New York Alms-house, he appeals to the observations and experience of several distinguished practitioners, particularly of Dr. Barton and of Dr. Hosack, for the importance and efficacy of this remedy in the treatment of most febrile disorders, particularly in intermitting and remitting fevers, yellow fever, and in other disorders; in many cutaneous affections, and in diseases of general debility. It may, however, be observed, that if it be exhibited as a warm decoction, it often proves emetic, and acts especially upon the skin, in producing diaphoresis: if in the form of cold infusion or decoction, or in substance, it acts as a powerful tonic. Dr. Anderson proceeds to detail six cases of intermittent fever in which, after a single evacuant, the thoroughwort effected radical cures, and adds, that the same remedy was administered in almost all the instances of intermittents that occurred in the New York Alms-house in the year 1812, to the exclusion of the Peruvian bark, and with uniform success. It was given either in decoction, or in powder from 20 to 30 grains every second hour during the intermission. In remitting fever, as a sudorific it produced the most salutary effects, and in those cases where tonics were indicated it proved no less advantageous. In the treatment of yellow fever he adduces the high authority of Dr. Hosack and Dr. Bard, who after proper evacuations placed almost exclusive dependence on sudorifics, and among this class of medicines the eupatorium administered in the form of decoction was deservedly considered of great value. The disease called by some the *petechial* or *spotted fever*, and by others the *malignant pleurisy* or *typhoid peripneumony*, has been more successfully

treated by the class of remedies denominated sudorifics than by any other, and in many cases of this epidemic which occurred in the city of New York in the winter of 1812-13, after the proper evacuations had been employed, the eupatorium was resorted to, and its sudorific, its tonic and its cordial properties were clearly demonstrated, and much benefit was derived from its use. In some obstinate cutaneous diseases, according to Dr. Barton, eupatorium has produced very beneficial effects. During the author's attendance in the New York Alms-house in the year 1812, very liberal recourse was had to this remedy in diseases arising from general debility. In anasarcous affections of the extremities, and in ascites when it may be considered as a disease of debility, the alcoholic tincture of eupatorium may be safely recommended as an excellent tonic; and in addition to its tonic effects, the properties of a diuretic render the employment of it still more advantageous in cases of this description.

EUPATORIUM TEUCRIFOLIUM. *A.*

Wild Horehound. The Herb.

This appears to correspond with what is said of *Eupatorium pilosum,* as introduced in the last edition of the American Dispensatory, viz:

This species of Eupatorium is also an annual plant; it rises from one to two feet. It grows wild in abundance in the southern states, where it has acquired great repute as a domestic remedy in the prevalent fevers of that climate. We are indebted to the honourable George Jones, Esq. president of the Georgia Medical Society, for the following sketch of its medical virtues. "It serves as an excellent substitute for the Peruvian bark; indeed, among the planters on or near the sea-board, it supersedes the use of the bark in the cure of fevers." It is tonic, diaphoretic, diuretic, and mildly cathartic, and does not oppress the stomach as the Peruvian bark is apt to do; hence it may often be exhibited where the cinchona is inadmissible. It is usually exhibited in the form of infusion; one ounce of the dried leaves, infused in a quart of water, may be taken daily in doses of from two to four ounces every hour or two. It may be advantageously combined with Peruvian bark; and although it may sometimes fail of producing the desired effect, it well deserves a station among the articles of the Materia Medica.

EUPATORIUM PURPUREUM. *A.* (*Secondary.*)

Gravel Root. The Root.

Of this article I know nothing, but presume its name of gravel root is derived from its real or supposed efficacy in calculous affections, &c.

EUPHORBIA IPECACUANHA. *A.*

Ipecacuanha Spurge. The Root.

This species of Euphorbia is common in the sandy soils of the middle and Southern States. The root runs into the sands, sometimes to the depth of six feet. From its analysis, by Professor Bigelow, he infers it to contain caoutchouc, resin, mucus, and probably fæcula.

It is a powerful emetic, both safe and certain in its operation; and applicable to most cases in which emetics are demanded. In small doses of 5 to 10 or 15 grains, it proves emetic; but up to 20 it also proves cathartic. Larger doses produce, in addition, heat, vertigo, indistinct vision, and prostration of strength. Although it may be considered as an useful addition to our native materia medica, it cannot be esteemed as equal to the officinal ipecacuan.

EUPHORBIA COROLLATA. *A.*

Large flowering Spurge. The Root.

This plant, in its chemical relations, is very similar to the preceding. It grows abundantly in most of the states; it is used sometimes as an emetic by the country people, and is esteemed in the cure of dropsy. It is by some thought not inferior to the officinal ipecacuan, and, like it, is said to form a valuable diaphoretic in combination with opium and sulphat of potash. In its recent state, the root excites inflammation and vesication.

The dose is from 10 to 20 grains; *occasionally* it excites catharsis. An extract from it may be given from 5 to 8 grains

Dr. M'Keen, in his experiments with this article, found the requisite doses to be from 3 to 12 grains; and in *every instance* it operated as a cathartic. Nausea, in most of the cases, occurred, but only in three did vomiting follow. He thinks it a certain purgative, and about double the strength of jalap. Its real merits are still to be ascertained, since the contradictory statements above tend to neutralize each other.

EUPHORBIA OFFICINARUM. *L.*

Officinal Euphorbia. The Gum Resin.

The London College have restored this drastic and corrosive substance to the list of officinals. It is produced from several species of the African genus Euphorbia; such as the *E. officinarum* of the Cape of Good Hope, the *E. antiquorum* which grows in Egypt, Arabia, and the East Indies, and which is said to have furnished the Euphorbium of the ancients, and the *E. canariensis*. Mr. Jackson, in his account of Morocco, has described it, but unfortunately not in the language of science. *Furbiune,* he says, is the Arabic name of

this gum, which is produced by a very curious succulent plant, growing on the Atlas mountains, and called by the Shellahs and Arabs, *Dergmuse.* From the main body of the plant, proceed several solid leafless branches, about three inches in circumference and one in diameter, from the top of which shoot out similar ones, each bearing on its summit a vivid crimson flower; these branches are scolloped, and have on their outer side small knots, from which grow five extremely sharp pointed thorns, about one-third of an inch in length. The stalk is at first soft and succulent, but becomes hard in a few years, when the plant assumes the above mentioned form, and may then be considered as at its maturity. The inhabitants of the lower regions of Atlas make incisions in the branches of the plant with a knife, from which a corrosive lacteous juice issues, which, after being heated by the sun, becomes a substance of a whitish yellow colour, and in the month of September drops off, and forms the gum Euphorbium. The plants produce abundantly only once in four years; but this fourth year's produce is more than all Europe can consume; for, being a very powerful cathartic, it is there little used. The people who collect the gum are obliged to tie a cloth over their mouth and nostrils, to prevent the small dusty particles from annoying them, as they produce incessant sneezing. The branches are used in the tanning of Morocco leather, and it is in great request among the women as a *depilatory.*

The gum is brought to us immediately from Barbary, in drops of an irregular form; some of which, on being broken, are found to contain little thorns, small twigs, flowers, and other vegetable matters; others are hollow, without any thing in their cavity; the tears, in general, are of a pale yellow colour externally, but somewhat white within: they break easily between the fingers. Braconnot has analysed euphorbium. He got from 100 parts, 37 of resin, 19 of wax, 20.5 of malate of lime, 2 of malate of potass, 13.5 of woody matter, 5 of water, and there was 3 of loss. Euphorbium is extremely troublesome to pulverize; the finer part of the powder, which flies off, affecting the head in a violent manner. The acrimony of this substance is so great, as to render it unfit for internal use. It burns with an agreeable smell and a bright flame. When applied to the tongue, it seems at first to have no taste, but on being held some time in the mouth, it excites a very violent biting and burning, which lasts a long time, and cannot be abated by washing the mouth.

EXTRACTA ET SPISSATA.

EXTRACTS AND INSPISSATED JUICES.

Extract, in pharmacy, has long been used, in the common and true acceptation of the term, to express a thing extracted, and therefore it was applied to substances of all kinds which were extracted from heterogeneous bodies, by the action of any menstruum, and again reduced to a consistent form, by the evaporation of that menstruum. Lately, however, Extract has been used in a different and much more limited sense, as the name for a peculiar principle, which is often indeed contained in extracts, and which before had no proper appellation. It is in the former sense that we employ it here, and in which we wish it to be only used, while a new word should be invented as the name of the new substance. Till a better be proposed, we shall call it *Extractive.*

The London College have also added to the confusion in their last edition, by applying the term extract to what are commonly called inspissated juices, where no menstruum is employed.

Extracts are of various kinds, according to the nature of the substances from which they are obtained, and the menstruum employed: but they commonly consist of gum, sugar, extractive, tannin, cinchonin, gallic acid, or resin, or several of them mixed in various proportions. The menstrua most commonly employed are water and alcohol. The former is capable of extracting all the substances enumerated, except the resin, and the latter all except the gum. Wine is also sometimes employed, but very improperly; for as a solvent it can only act as a mixture of alcohol and water, and the principles which it leaves behind, on evaporation, are rather injurious than of advantage to the extract.

Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat.

Watery extracts are prepared by boiling the subject in water, and evaporating the strained decoction to a thick consistence.

It is indifferent, with regard to the medicine, whether the subject be used fresh or dry; since nothing that can be preserved in this process will be lost by drying. With regard to the facility of extraction, however, there is a very considerable difference; vegetables in general giving out their virtues more readily when dried than when fresh.

In many cases, it is necessary to assist the action of the menstruum by mechanical division, but it should not be carried so far as to reduce the substance to a very fine powder; as Fabroni found that cinchona, at least, yielded a larger proportion of extract when only coarsely powdered.

The quantity of water ought to be no greater than is necessary for

extracting the virtues of the subject. This point, however, is not very easily ascertained; for, although some of the common principles of extracts be soluble in a very small proportion of water, there are others, such as the tannin, of which water can dissolve only a certain proportion, and cannot be made to take up more by any length of boiling; besides, we have no very good method of knowing when we have used a sufficient quantity of water; for vegetable substances will continue to colour deeply successive portions of water boiled with them, long after they are yielding nothing to it but colouring matter. One of the best methods is, to boil the subject in successive quantities of water, as long as the decoctions form a considerable precipitate with the test which is proper for detecting the substance we are extracting, such as a solution of gelatin for tannin, of alum for extractive, &c.

The decoctions are to be evaporated after they have been filtered boiling hot, without any farther depuration; because some of the most active principles of vegetable substances, such as tannin, are much more soluble in boiling than in cold water, and because almost all of them are very quickly affected by exposure to the atmosphere. Therefore, if a boiling decoction, saturated with tannin, be allowed to cool, the greatest part of the very principle on which the activity of the substance depends, will separate to the bottom, and, according to the usual directions, will be thrown away as sediment. The same objection applies more strongly to allowing the decoction to cool, and deposit a fresh sediment, after it has been partially evaporated. Besides, by allowing the decoctions to stand several days before we proceed to their evaporation, we are, in fact, allowing the active principles contained in the decoction, to be altered by the action of the air, and to be converted into substances, perhaps inactive, which also are thrown away as sediment.

The evaporation is most conveniently performed in broad shallow vessels; the larger the surface of the liquor, the sooner will the aqueous parts exhale. This effect may likewise be promoted by agitation.

When the matter begins to grow thick, great care is necessary to prevent its burning. This accident, almost unavoidable if the quantity be large, and the fire applied, as usual, under the evaporating basin, may be effectually prevented, by pouring the extract, when it has acquired the consistence of a syrup, into shallow tin or earthen pans, and placing these in an oven with its door open, moderately heated; which, acting uniformly on every part of the liquid, will soon reduce it to any degree of consistence required. This may likewise be done, and more securely, by setting the evaporating vessel in boiling water; but the evaporation is in this way very tedious. Dr. Powell has figured a modification of the common tin sauce-pan for this purpose. It is nothing but putting a tin evaporating dish over a sauce-pan filled with water, which is made to boil.

Alcohol is much too expensive to be employed as a menstruum

for obtaining extracts, except in those cases where water is totally inadequate to the purpose. These cases are,

1*st*, When the nature of the extract is very perishable when dissolved in water, so that it is liable to be decomposed before the evaporation can be completed; especially if we cannot proceed immediately to the evaporation.

2dly, When water is totally incapable of dissolving the substance to be extracted; and,

3dly, When the substance extracted can bear the heat of boiling alcohol without being evaporated, but would be dissipated by that of boiling water; that is, when it requires a heat greater than 176° and less than 212°, for its evaporization.

In the last case, the alcohol must be perfectly free from water, because the heat necessary to evaporate it at the end of the process would frustrate the whole operation. Hence, also, the subject itself ought always to be dry: those substances, which lose their virtue by drying, lose it equally on being submitted to this treatment with the purest alcohol.

In this way the alcoholic extract of some aromatic substances, as cinnamon, lavender, rosemary, retain a considerable degree of their fine flavour.

In the second case, the alcohol need not be so very strong, because it is capable of dissolving resinous substances, although diluted with a considerable proportion of water.

In the first case, the alcohol may be still much weaker; or rather, the addition of a small proportion of alcohol to water will be sufficient to retard or prevent the decomposition of the decoction.

The alcohol employed in all these cases should be perfectly free from any unpleasant flavour, lest it be communicated to the extract.

The inspissation should be performed from the beginning, in the gentle heat of a water-bath. We need not suffer the alcohol to evaporate in the air: the greatest part of it may be recovered by collecting the vapour in common distilling vessels. If the distilled spirit be found to have brought over any flavour from the subject, it may be advantageously reserved for the same purposes again.

When diluted alcohol is employed, the distillation should only be continued as long as alcohol comes over; and the evaporation should be finished in wide open vessels.

In this chapter we have also included the processes intended for purifying inspissated juices and resinous substances.

Pure resins are prepared, by adding, to spiritous tinctures of resinous vegetables, a large quantity of water. The resin, incapable of remaining dissolved in the watery liquor, separates and falls to the bottom; leaving in the menstruum such other principles of the plant as the spirit may have extracted at first along with it. But this is only practised for the purpose of analysis.

Under the head of Extracts, the United States' Pharmacopœia includes the extracts and inspissated juices of former Pharmacopœias.

Succi Expressi. *Expressed Juices.*

The juices of succulent plants are obtained by expression. They are of a very compound nature, consisting of the sap, the secreted fluids, and fecula, mixed together. When first procured, they are very high coloured, turbid, and loaded with parenchymatous matter. They may be separated by rest, filtration, heat, and clarification. Rest may be employed when the juice is very fluid, does not contain volatile matter, and is not susceptible of alteration. It is, however, employed with advantage with sub-acid juices, as that of lemons. By rest they undergo a kind of slight fermentation, and all their mucilaginous and other viscid parts, separate. Filtration is perhaps the most perfect, but it is tedious, and applicable only to very fluid juices. In many instances it may be facilitated by the addition of water. The action of heat is more expeditious, and is employed for juices which are very alterable, or which contain volatile matters. It is performed by introducing the juice into a matrass, and immersing it in boiling water for some minutes. The feculæ are coagulated, and easily separated by filtration. Clarification by white of egg can only be used for very viscid mucilaginous juices, which contain nothing volatile. The white of two eggs may be allowed to each pint of juice. They are beat to a fine froth, the juice gradually mixed with them, and the whole brought to ebullition. The albumen coagulating envelops all the parenchymatous and feculent matters, and the juice now passes the filter readily. By this process juices are rendered sufficiently fine; but the heat employed deepens their colour, and manifestly alters them, so that it is not merely a defecating, but a decomposing process. When depurated, juices are yellow or red, but never green.

The fluids thus extracted from succulent fruits, whether acid or sweet; from most of the acrid herbs, as scurvy-grass and water-cresses; from the acid herbs, as sorrel and wood-sorrel; from the aperient lactescent plants, as dandelion and hawkweed, and from sundry other vegetables, contain great part of the peculiar taste and virtues of the respective subjects. The juices, on the other hand, extracted from most of the aromatic herbs, have scarcely any thing of the flavour of the plants, and seem to differ little from decoctions of them made in water, boiled till the volatile odorous parts have been dissipated. Many of the odoriferous flowers, as the lily, violet, hyacinth, not only impart nothing of their fragrance to their juice, but have it totally destroyed by the previous bruising. From want of sufficient attention to these particulars, practitioners have been frequently deceived in the effects of preparations of this class: juice of mint has been often prescribed as a stomachic, though it wants those qualities by which mint itself and its other preparations operate.

There are equal differences in regard to their preserving those virtues, and this independently of the volatility of the active matter, or its disposition to exhale. Even the volatile virtue of scurvy-grass may, by the above method, be preserved almost entire in

its juice for a considerable time; while the active parts of the juice of the wild cucumber quickly separate and settle to the bottom, leaving the fluid part insert. Juices of arum root, iris root, bryony root, and other vegetables, in like manner allow their medicinal parts to settle at the bottom.

If juices are intended to be kept for any length of time, about one fortieth part of their weight of good spirit of wine may be added, and the whole suffered to stand as before; a fresh sediment will now be deposited, from which the liquor is to be poured off, strained again, and put into small bottles which have been washed with spirit and dried. A little oil is to be poured on the surface, so as very nearly to fill the bottles, and the mouths closed with leather, paper, or stopped with straw, as the flasks are in which Florence oil is brought to us: this serves to keep out dust, and suffers the air to escape, which in process of time arises from all vegetable liquors, and which would otherwise endanger the bursting of the glasses; or being imbibed afresh, render their contents vapid and foul. The bottles are to be kept on the bottom of a good cellar or vault, placed up to the necks in sand. By this method some juices may be preserved for a year or two; and others for a much longer time, though, whatever care be taken, they are found to answer better when fresh; and from the difficulty of preserving them, they have of late been very much laid aside, especially since we have been provided with more convenient and useful remedies.

Succi Spissati. *Inspissated Juices.*

This is a very convenient form for the exhibition of those substances which are sufficiently succulent to afford a juice by expression, and whose virtues do not reside in any very volatile matter. By inspissation, the bulk of the requisite dose is very much diminished; they are reduced to a form convenient for making up into pills; and they are much less apt to spoil than the simple expressed juices. The mode of their preparation is not yet, however, reduced to fixed principles. Some direct the juices to be inspissated as soon as they are expressed; others allow them previously to undergo a slight degree of fermentation; some defecate them before they proceed to inspissate them, and lastly, Baumé prepares his elaterium by inspissating the defecated juice of the wild cucumber, while the colleges give the same name to the matter which subsides from it. The nature of the soil, of the season, and many other circumstances, must materially alter the quantity or nature of the product. In moist years Baumé got from thirty pounds of elder berries, four or five pounds of inspissated juice, and in dry years only two, or two and a half. From hemlock he got in October, 1769, 7.5 per cent. of inspissated juice, and in May of the same year, only 3.7; on the contrary, in August, 1768, 4 per cent. and in May 1770, 6.5; but in general the product in the autumn months was greatest.

EXTRACTUM ACONITI. *A.*

SUCCUS SPISSATUS ACONITI NAPELLI. *E.*

Extract (Inspissated Juice) of Aconite, or Wolfsbane.

Take of

Fresh aconite, any quantity.

Bruise it in a mortar, and having sprinkled on it a little water, press it strongly in a hempen bag till it yields its juice. Evaporate this immediately in flat vessels, in a bath of boiling water saturated with muriat of soda, till it is brought to the consistence of thick honey. During the latter part of the process it should be stirred with a wooden spatula.

After the mass has become cold, it must be put up in glazed earthen vessels, and moistened with alcohol.

In the same manner are prepared

EXTRACTUM BELLADONNÆ. *A. L. D.*

Extract (Inspissated Juice) of Deadly Nightshade.

From the leaves.

EXTRACTUM CONII. *A.*

EXTRACTUM CICUTÆ. *D.* *Extract of Hemlock.*

From the leaves.

EXTRACTUM HYOSCYAMI. *A. L. D. E.* *Extract of Henbane.*

From the plant.

EXTRACTUM STRAMONII. *A.* *Extract of Thorn Apple.*

From the leaves.

EXTRACTUM SAMBUCI. *A.*

SUCCUS SPISSATUS SAMBUCI NIGRI. *E.*

Extract (Inspissated Juice) of Elder (berries).

Take ripe elder berries, bruise them and press out the juice through a hempen or linen bag; to five pints of this juice, add one pound of sugar, and evaporate to the consistence of thick honey.

This is the old rob of elder, yet, although of very ancient date, it would be difficult to point out any real medicinal powers of impor-

tance in it. The juice of black currant, lemon, &c. may be prepared in the same manner.

These inspissated juices contain the virtues of the respective vegetables, in a very concentrated state. Those of the elder, black currant, and lemon, are acidulous, cooling, and laxative, and may be used in considerable quantities, while those of the wolfsbane, hemlock, deadly nightshade, henbane, and poisonous lettuce, are highly narcotic and deleterious, and must be given only in very small doses.

EXTRACTS MADE WITH WATER.

All simple extracts, unless otherwise ordered, are to be prepared according to the following rule.

The vegetable matter is to be boiled in eight times its weight of water, to one half; the liquor is then to be expressed, and, after the fæces have subsided, to be filtered; it is then to be evaporated with a heat between 200 and 212°, until it becomes thickish; and, lastly, it is to be evaporated with a heat less than 200°, and frequently stirred, until it acquire a consistence proper for forming pills.

All extracts, when they begin to thicken, ought to be frequently stirred with a clean iron spatula. They may be reduced to a proper thickness by means of a stove heated on purpose. They ought to be preserved as much as possible from the contact of air, and the softer ones should be sprinkled with rectified spirit.

Extractum Aloes Purificatum. *L. Purified Extract of Aloes.*

Take of
Socotorine aloes, in powder, ... half a pound;
Boiling water, ... four pints.

Macerate in a gentle heat for three days, then strain, and set it at rest till the fæces subside. Pour off the clear liquor, and evaporate to a proper thickness.

This is supposed to be less irritating than the aloes itself, but it appears to be an unnecessary refinement.

EXTRACTUM ANTHEMIDIS. *A. L. Extract of Chamomile.*

Take of
Dried chamomile, . . . one pound;
Water, ... one gallon.

Pour the water upon the chamomile, boil down to four pints, and strain the liquor while hot, with compression. Evaporate the decoction immediately to the consistence of thick honey in a bath of boiling water.

In like manner are prepared

EXTRACTUM GENTIANÆ. *A. L.* *Extract of Gentian.*

EXTRACTUM HÆMATOXYLI. *A. L.* *Extract of Logwood.*

EXTRACTUM HELLEBORI NIGRI. *A. E. D.*
Extract of Black Hellebore.

EXTRACTUM JUGLANDIS. *A.* *Extract of Butternut.*

From the inner bark of the root.

EXTRACTUM QUASSIÆ. *A.* *Extract of Quassia.*

From the rasped wood.

The following watery extracts are prepared by the British Colleges, but have not gained admission into the United States' Pharmacopœia.

EXTRACTUM CINCHONÆ. *D. L.*
Extract of Cinchona, or Peruvian Bark.

Take of
Lance-leaved cinchona, in coarse powder, . . . one pound;
Water, ... six pints.

Boil, for a quarter of an hour, in a vessel almost covered; filter the decoction while hot through linen, and set it aside. Boil the residuum again, in the same quantity of water, and filter it in the same manner. This may be repeated a third time, and all the decoctions are to be mixed and reduced to a proper degree of thickness by evaporation.

This extract ought to be kept in two states; one soft, adapted for making pills; and the other hard, capable of being pulverised. *D.*

EXTRACTUM COLOCYNTHIDIS. *L.* *Extract of Colocynth.*

Take of
Pulp of colocynth, ... one pound;
Water, ... one gallon.

Boil to four pints, and filter the liquor while hot. Lastly, evaporate to a proper thickness.

Mr. Phillips says, that it is scarcely possible to boil the colocynth in the assigned quantity of water, and that the extract obtained is remarkably spongy, and very soon becomes hard and mouldy.

Extractum Glycyrrhizæ. *L.* *Extract of Liquorice.*

Take of
Liquorice root, sliced, ... one pound;
Boiling water, ... one gallon.
Macerate for twenty-four hours; then boil down to four pints, and filter the liquor while still hot; lastly, evaporate it to a proper thickness.

Extractum Humuli. *L.* *Extract of Hops.*

Take of
Hops, ... four ounces;
Boiling water, ... a gallon.
Boil down to four pints, strain the hot liquor, and evaporate it to a proper consistence.

In the former edition, 1809, the quantity of hops was half a pound, in regard to which Mr. Phillips says, that the proportion of water ordered was considerably too small. It has accordingly been corrected.

Extractum Opii. *D. L.* *Extract of Opium.*

Take of
Opium, ... two ounces;
Boiling water, ... one pint.
Triturate the opium in the water, for ten minutes; then, after waiting a little, pour off the liquor, and triturate the remaining opium with the same quantity of boiling water, pouring off the infusion in the same manner. This may be repeated a third time. Mix the decanted liquors, and expose the mixture to the air, in an open vessel, for two days. Lastly, filter through linen, and, by slow evaporation, form an extract.

Extractum Papaveris. *L.* *Extract of Poppy.*

Take of
Poppy heads, bruised without the seeds, . . . one pound;
Boiling water, ... a gallon.
Macerate for twenty-four hours; then boil to four pints: strain the liquor while hot, and evaporate to a proper thickness.

Extractum Sarsaparillæ. *L.* *Extract of Sarsaparilla.*

Take of
Sarsaparilla root, sliced, ... one pound;
Boiling water, ... one gallon.
Macerate for twenty-four hours; then boil to four pints, and filter the liquor while hot; lastly, evaporate to a proper thickness.

EXTRACTUM TARAXACI. *L.* *Extract of Dandelion.*

Take of
Fresh dandelion root, bruised, . . . one pound;
Boiling water, ... one gallon.
Macerate for twenty-four hours; then boil to four pints, and filter the liquor while hot; lastly, evaporate to a proper thickness.

EXTRACTUM VALERIANÆ. *D.* *Extract of Valerian.*

Take of
Valerian root, in coarse powder, ... six ounces;
Boiling water, ... three pints.
Mix and digest, with a moderate heat, for twenty-four hours, in a covered vessel; then express the liquor, and evaporate it to a proper thickness.

ALCOHOLIC EXTRACTS.

EXTRACTUM CINCHONÆ. *A.*

EXTRACTUM CINCHONÆ (OFFICINALIS. *E.*) LANCIFOLIÆ. *L.*

Extract of Cinchona or Peruvian Bark.

Take of
Peruvian bark, in powder, . . . one pound;
Alcohol, ... four pints.
Digest for four days, and pour off the tincture.
Boil the residuum in five pints of distilled water, for fifteen minutes, and strain the decoction boiling hot, through linen. Repeat this decoction and filtration, with the same quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey.
Draw off the alcohol from the tincture by distillation, until this also becomes thick; then mix the liquors thus inspissated, and evaporate them in a bath of boiling water, saturated with muriat of soda, to a proper consistence.

Cinchona bark is a medicine of very great importance; but, unfortunately, the proportion of woody fibres, or inert matter, which enters into its composition, is so great, that weak stomachs cannot bear it, when given in quantity sufficient to produce any very powerful effects. On this account, the preparation of an extract, which may contain its active principles in a concentrated form, is a desirable object. On this subject there is still much room for experiment. The London College, in its former Pharmacopœia, certainly erred in two important particulars; in the first place, in desiring the decoction to be continued until the greatest part of the menstruum was evaporated; and, in the second place, in separating, by filtration,

the powder which separated from the decoction after it had cooled The first error probably originated in the idea, that, by continuing the boiling for a great length of time, more of the bark would be dissolved; but it is now known, that water is incapable of dissolving more than a certain quantity of the active principles of cinchona; and that after the water has become saturated, by continuing the decoction we diminish the quantity of the menstruum, and therefore also diminish the quantity of bark dissolved. It is not easy to account for the second error; for, according to the old idea, that the powder which separated, on cooling, from a saturated decoction of cinchona, was a resinous substance, it surely ought not to have been rejected from what were supposed to be resinous extracts. This precipitate is now known to be caused by the much greater solubility of its active principles in boiling than in cold water; so that the precipitate is not different from what remains in solution. Accordingly, it has been ascertained, by experiment, that cinchona gave at least one half more extract when the decoction was conducted according to the directions of the Edinburgh College; and the London College, in their present Pharmacopœia, have improved their processes on the same principles.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. *A. L. D.*

Compound Extract of Colocynth.

Take of
Colocynth, sliced, ... six drachms;
Socotrine aloes, powdered, ... one ounce and a half;
Scammony, powdered, ... half an ounce;
Cardamoms, powdered, ... one drachm;
Diluted alcohol, ... one pint.

Digest the colocynth in the diluted alcohol, for four days in a gentle heat; strain the solution, and add to it the aloes and scammony; then evaporate the alcohol until the mass has acquired a proper consistence, and about the end of the inspissation, mix in the cardamoms.

EXTRACTUM JALAPÆ. *A. L.*

Extract of Jalap.

Take of
Jalap, powdered, . . . one pound;
Alcohol, ... four pints;
Water, ... ten pints. (Unnecessary quantity.)

Macerate the jalap in the alcohol for four days, and pour off the tincture; boil the remaining powder in the water until it be reduced to two pints; then strain the tincture and decoction separately, and let the former be distilled, and the latter evaporated,

until each begins to grow thick. Lastly, mix the two together, and reduce to a proper consistence by evaporation.

Let this extract be kept in a SOFT state fit for forming pills, and in a HARD one so that it may be reduced to powder.

In the same way is prepared

EXTRACTUM PODOPHYLLI. *A.*

Extract of May Apple.

The following Alcoholic Extracts are not noticed in the United States' Pharmacopœia.

EXTRACTUM RHEI. *L.*

Extract of Rhubarb.

Take of
Rhubarb root, in powder, ... one pound;
Proof spirit, ... one pint;
Water, ... seven pints.

Macerate, with a gentle heat, for four days; then filter and set it aside, until the fæces subside. Pour off the liquor clear, and evaporate to a proper thickness.

EXTRACTUM CASCARILLÆ RESINOSUM. *D.*

Resinous Extract of Cascarilla.

Take of
Cascarilla, in coarse powder, ... one pound;
Rectified spirit of wine, ... four pints.

Digest for four days; then pour off the tincture, and strain; boil the residuum, in ten pints of water, to two; evaporate the filtered decoction, and distil the tincture, in a retort, till both begin to grow thick; then mix them, and evaporate them to a state fit for making pills. Lastly, they are to be intimately mixed.

The real advantage of so expensive an agent as alcohol, in preparing any of these extracts, has not been demonstrated; and it is said to be seldom employed even in preparing what are called *Resinous Extracts.*

F.

FERRUM.—*IRON.*

Iron is of a bluish-grey colour; texture either fine-grained, fibrous, or dense plates; sapid and odorous; specific gravity 7.600; the hardest and most elastic and most tenacious metal; very ductile; fusing at 158° Wedgwood; fushion at first clammy, afterwards very fluid; igniting by strong percussion, and inflaming by the collision of flint; magnetic. It is oxydized slowly in the air, especially when moist; when heated in contact with air, it is changed to a black oxyd, containing 20 to 27 of oxygen; fusible, hard, brittle, lamellated, still attracted by the magnet; afterwards into a brown, red, fine, pulverurent oxyd, not attracted by the magnet, containing 0.40 to .49 of oxygen. It burns with splendour and deflagration in oxygen gas, and is converted into a fused, black oxyd; it decomposes water slowly, and when ignited, very rapidly. In some instances it is dissolved in hydrogen gas. Carbon united to iron, converts it into steel.

Steel is of a grey colour, brilliant and granular in its fracture; specific gravity 7.795; harder than any of the metals, and more elastic, ductile, malleable, and fusible at a lower temperature than pure iron. Its characteristic property is, that after being heated, if suddenly plunged into cold water, it becomes harder, more elastic, less pliable and brittle; but by being again heated and cooled slowly, it acquires its former softness, pliability and ductility. Steel contains only some hundredth parts of carbon, and is known chemically, by letting a drop of acid fall upon it, which produces a grey or black spot.

Plumbago consists of about 0.1 of iron, combined with carbon in its first degree of oxydizement. The phosphuret of iron is white, granulated, brittle, permanent in the air. Its sulphuret is yellow, hard, brittle, and very fusible, oxydizing slowly in a humid atmosphere. Iron forms alloys with arsenic, cobalt, manganese, bismuth, antimony, zinc, and tin. Iron is oxydized and dissolved by almost all the acids; oxyds, black, brown, red. It gives glasses a brown, smoky, deep green or black colour.

Iron is the most common of all metals. It seems even to be a constituent of organic substances, and is the only metal which, when taken into the body, exerts no deleterious action upon it. The numerous ores of iron which are found in every part of the globe, may be reduced to the following genera.

1. Native iron. Immense isolated masses of this have been found in Siberia and in South America. Their origin is still perfectly problematical.
2. Carbureted iron. Plumbago.
3. Sulphureted iron. Pyrites.
4. Oxydized iron.

a. Protoxyd. Magnetic iron ore; colour black or grey.
b. Peroxyd. Not magnetic; colour red or brown,
c. Carbonated.
d. Arseniated.
e. Tungstated.

As its mechanical division is extremely difficult, it is directed to be kept in the shops in the state of filings or wire, and the scales of black oxyd, which are found around the smith's anvil. Soft malleable iron is the only kind fit for internal use, as steel and cast iron always contain impurities, and often arsenic.

Ferrum. *E. L. D.*

Iron. Iron Filings. Iron Wire.

FERRI LIMATURÆ PURIFICATÆ. *A. E.*

Purified Filings of Iron.

Place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve. *E.*

This process does not fulfil the purpose for which it is intended; for the adhesion of a very small particle of iron renders brass and other metals attractable by the magnet. The filings of iron got from the shops of different artificers, which are always mixed with solder, and other metals, cannot be purified in this way, so as to render them fit for internal use; and indeed the only way they can be obtained sufficiently pure, is by filing a piece of pure iron with a clean file.

Perhaps the borings of cannon would supply an ample amount of iron in its purest state for all the purposes to which metallic iron is applied.

Medical use.—The general virtues of this metal, and the several preparations of it, are, to constringe the fibres, to quicken the circulation, to promote the deficient secretions in the remoter parts, and at the same time to repress inordinate discharges into the intestinal tube. After the use of them, if they take effect, the pulse is very sensibly raised; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions are increased. Fetid eructations, and the fæces voided of a black colour, are marks of their taking due effect.

When given improperly or to excess, iron produces headach, anxiety, heats the body, and often causes hemorrhages, or even vomiting, pains in the stomach, and spasms and pains in the bowels.

Iron is given in most cases of debility and relaxation.

1. In passive hemorrhages.
2. In dyspepsia, hysteria, and chlorosis.
3. In most of the cachexiæ.
4. In general debility produced by disease, or excessive hemorrhage.

Where either a preternatural discharge, or suppression of natural secretions, proceed from a languor and sluggishness of the fluids, and weakness of the solids; this metal, by increasing the motion of the former, and the strength of the latter, will suppress the flux, or remove the suppression; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodic contraction of the vessels, iron, and all the preparations of it, will aggravate both distempers.

Iron probably has no action on the body when taken into the stomach, unless it be oxydized. But during its oxydizement, hydrogen gas is evolved; and accordingly we find that fetid eructations are considered as a proof of the medicine having taken effect. It can only be exhibited internally in the state of filings, which may be given in doses of from five to twenty grains, either in the form of powder, with some aromatic, or made into an electuary or bolus or pills with any bitter extract. Iron-wire is to be preferred for pharmaceutical preparations, both because it is the most convenient form, and because it is always made of the purest iron.

Ferri Oxydum Nigrum. *E.* Ferri Oxydi Squamæ. *D.*

Scales of Iron, or of the Oxyd. Finery Cinder.

When iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxydized by the action of the atmospheric air; and as the oxyd formed does not adhere to the iron, it is easily separated by percussion on the anvil, and flies off in the state of sparks, which, on cooling, constitute the scales of iron. In these the iron is oxydized to that degree in which it is soluble in acids without the production of hydrogen gas; therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings.

Oxydum Ferri Nigrum Purificatum. *E. D.*

Purified Black Oxyd of Iron.

Let the scales of the oxyd of iron, which are to be found at the foot of the blacksmith's anvil, be purified by the application of a magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure *E.*

Here the application of the magnet is useful, because these scales contain no foreign metal, but are mixed with earthy and other impurities, which could be separated in no other way.

OXYDUM FERRI RUBRUM. *A. E. D.*

Red Oxyd of Iron. Colcothar.

Take of
Sulphat of iron, any quantity.
Expose it to the action of a moderate heat in an unglazed earthen vessel, until it becomes white and perfectly dry. Then increase the heat, until it is converted into a very red powder.

By the violent heat applied in this preparation, the sulphat of iron is completely decomposed, and copious white fumes are expelled. The iron is converted into the red oxyd; part of the sulphuric acid is therefore reduced to the state of sulphurous acid, and the rest of the acid is expelled in a very concentrated state. This process was formerly employed in Great Britain, and still is employed in Germany for the preparation of sulphuric acid; which, however, from the presence of the sulphurous acid, was possessed of some peculiar properties, such as emitting fumes and crystallizing. The residuum is composed of red oxyd of iron, combined with a little red sulphat of iron, which renders it deliquescent. To obtain the oxyd perfectly pure, the residuum must therefore be washed with water, and dried quickly, to prevent the absorption of carbonic acid.

FERRI SULPHAS. *A. E. D. L.*

Sulphat of Iron. Green Vitriol. Copperas.

The sulphat of iron of commerce is commonly obtained by the spontaneous oxydizement of sulphureted iron, and subsequent lixiviation and crystallization. It is never pure, and often contains zinc or copper. The copper may be separated by adding some metallic iron to the solution, but we have no means of separating the zinc.

Although the native sulphat of iron may be purified by solution, filtration and crystallization, sufficiently for many purposes, yet it cannot, it is said, be procured perfectly pure except by the direct union of sulphuric acid and iron; and as it is of consequence that it should be pure when administered internally, directions for its preparation have been given. The following is the formula of the Edinburgh College.

Sulphas Ferri. *E. D. L.*

Sulphat of Iron. Salt of Iron. Sal Martis.

Take of
Purified filings of iron, . . . six ounces;
Sulphuric acid, ... eight ounces;
Water, ... two pints and a half.
Mix them, and after the effervescence ceases, digest the mixture for

some time upon warm sand; then strain the liquor through paper, and after due evaporation set it at rest to crystallize. *E.*

The crystals of sulphat of iron are transparent rhomboidal prisms, of a fine green colour. They are soluble in two parts of cold, and in less than their own weight of boiling water. They are insoluble in alcohol.

They are composed of

Black oxyd of iron,	28	36 Green hydro-oxyd of iron.
Water of composition,	8	
		26 Sulphuric acid.
		38 Water of crystallization.
		100

Green sulphat of iron is decomposed by all the earths and alkalies, and by those salts whose base forms an insoluble compound with sulphuric acid. It is also decomposed by exposure to the air, especially when in solution, and by all substances which part readily with their oxygen. The oxyd of iron absorbs oxygen, and passes to the state of red oxyd, which forms a red sulphat, possessing properties very different from those of the green sulphat.

Taken internally, the green sulphat is apt to excite pain in the stomach, and spasms in the bowels; and in large doses it causes vomiting. In small doses, however, of from one to three grains, it is sometimes given as a tonic, astringent, or anthelmintic.

Sulphas Ferri Exsiccatus. *E. D.*

Dried Sulphat of Iron.

Take of

Sulphat of iron, . . . any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it becomes white and perfectly dry. *E.*

The heat applied here must not be so great as to decompose the sulphat of iron, but only to deprive it of its water of crystallization.

CARBONAS FERRI PRÆPARATUS. *A.*

Subcarbonas Ferri Præparatus. *E. D.*

Rubigo Ferri, &c. &c. *Rust of Iron.*

Carbonat (Subcarbonat) of Iron Prepared.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder. *E.*

Iron is one of the most easily oxydized of the metals. It is capable of attracting oxygen from the air, and of decomposing water even in the cold. By exposure at the same time to air and moisture, it is very quickly oxydized, while it also absorbs carbonic acid, and is converted into a reddish brown pulverulent substance, well known by the name of rust of iron. For medical use it is prepared as the other substances insoluble in water.

CARBONAS FERRI PRÆCIPITATUS. *A.*

FERRI SUBCARBONAS. *L.*

Precipitated Carbonat of Iron.

Take of
Sulphat of iron, ... eight ounces;
Subcarbonat of soda, . . . six ounces;
Boiling water, ... a gallon.

Dissolve the sulphat of iron, and subcarbonat of soda, separately, each in four pints of water; next mix the solutions together, and set the mixture by, that the precipitated powder may subside; then having poured off the supernatant liquor, wash the carbonat of iron with hot water, and dry it upon bibulous paper in a gentle heat.

On mixing the solution of these salts together, there is an immediate mutual decomposition. Sulphat of soda is formed, which remains in solution, and carbonat of iron, which is precipitated of a green colour. The precipitate when first formed, is the carbonat of black oxyd of iron, or contains the iron in the state of black oxyd, the state in which it exists in the green sulphat of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and is converted into the carbonat of red oxyd of iron. As the precipitate is extremely light and bulky, it is not easily separated by allowing it to subside, and pouring off the clear liquor; filtration should therefore be employed. The carbonat of soda is used in preference to the carbonat of potass, on account of the greater solubility of sulphat of soda than of sulphat of potass, which renders the subsequent ablution of the salt more easy.

Mr. Phillips found very great differences in the results, from very slight differences in conducting the process, as appears from the following table, to which is added the results when subcarbonat of potass was employed instead of subcarbonat of soda.

Precipitated in	washed in	Dried by	Carb. acid per cent.	Subcarbonat of soda.	Carb. acid per cent.	Subcarbonat of Potass.
Hot w.	Hot w.	steam.	14.5	Chocolate br.	7	Orange br.
. . . . .	. . . . .	the air.	14.5	Yellowish br.		
. . . . .	Coldw.	steam.	1.5	Orange br.	2	Brick red.
Coldw.	Hot w.	. . . . .	8.0	Purplish br.		
. . . . .	Coldw.	. . . . .	1.0	Reddish br.		
. . . . .	. . . . .	the air.	none	Ochre yel.		
Water kept near 212° for an hour.		steam.	1.3	Blackish br.	3	Orange br.

These differences indicate the precipitates to be mixtures of peroxyd, protoxyd, and subcarbonat of protoxyd of iron, in various proportions. The peroxyd is deep red or yellow, as the oxygen is quickly or slowly absorbed; the protoxyd is black, and its carbonat brown. When cold water only is used in this process, carbonat of iron remains in the solution, from which the oxyd has been precipitated; when hot water is used, part of the carbonic acid is expelled, the subcarbonat is precipitated mixed with oxyd; but when heat is long applied, the subcarbonat itself is decomposed, and the precipitate is chiefly oxyd. Mr. Phillips concludes, that it is more economical to use hot water in every part of the process, and to use potass instead of soda in the preparation.

Medical use.—The carbonat of iron is an excellent and safe chalybeate. It may be given in doses of from five grains to sixty; but all chalybeates answer better in small doses, frequently repeated, than in large doses. *Q. E. D.*

Aqua Ferri Ærati. *D.* *Water of Aërated Iron.*

It is prepared in the same manner as the water of fixed air, by suspending in the water half an ounce of iron wire. *D.*

This is a very elegant chalybeate. The iron is in the state of black oxyd, and is dissolved by means of carbonic acid. It was first prepared by Bergmann, in imitation of the natural chalybeate waters, and it forms an excellent substitute for them.

LIQUOR FERRI ALKALINI. *A. L.*

Solution of Alkaline Iron.

Take of

Iron,	two drachms and a half;
Nitric acid,	two fluid ounces;
Distilled water,	six fluid ounces;
Solution of sub-carbonat of potass,	six fluid ounces.

Mix the water and acid, and pour them upon the iron. As soon as the effervescence has ceased, pour off the acid solution; add this gradually, and at intervals, to the solution of sub-carbonat of potass, shaking it occasionally, until after having become of a dark red colour, no more effervescence be excited. Lastly, let it stand for six hours, and pour off the solution.

This preparation of iron is so entirely different from all others in its nature, that Dr. Duncan thinks the London College right in introducing it into their Pharmacopœia. The chemical nature of the composition has not been accurately ascertained, and the preparation is attended with considerable difficulty and uncertainty. Dr. Powell says, that the solution of the iron should be made slowly,

and that it ought not to be nearly saturated, but have an excess of acid; that it ought to be clear, and slightly greenish, and if, by excess of iron, it have a reddish-yellow colour, a little acid is to be added, which will bring it to the proper state; that the acid solution should be added gradually to the alkaline, although it will succeed the other way; and that, although the proportions are pretty nearly given, they require to be checked by occasional examination, especially by the taste, which should be slightly alkalescent. He also adds, that after standing, nitrat of potass generally crystallizes, from which the clear deep red solution is to be poured off. Mr. Phillips, in his remarks upon this preparation, says, that there is no danger of iron being dissolved in excess, as the acid is capable of dissolving more than twice the quantity of iron ordered; and the solution thus obtained, though so nearly saturated as to excite little effervescence when added to the solution of carbonat of potass, answers perfectly well for making this preparation; but even when the proportions of the College are adopted, the quantity of alkali is too small; and it is necessary to use about one-twelfth more than is directed, in order to dissolve the oxyd of iron, although more than requisite to saturate the acid, and to give a decided alkaline taste. Mr. Phillips considers it as a solution of peroxyd of iron in sub-carbonat of potass. Hagen says, that the preparation does not succeed with caustic potass; and that the more the alkali is carbonated, the better.

Mr. Phillips remarks, that if five parts of water be added to one of this preparation, in a few minutes the oxyd of iron is almost entirely precipitated, frustrating the probable intentions of the preparation, that of exhibiting iron in solution with an alkali; which, however, may be effected by means of the solution of tartarized iron, which is not decomposed by sub-carbonat of potass. Dr. Powell, on the contrary, praises this preparation much. He considers it as affording a combination of iron distinct from any other, and often applicable to practice; and adds, "If I was to speak individually of its powers, I should consider them as more considerable than those of any other preparation of the metal in many cases attended with debility of stomach, and it has been also prepared in some large shops, and not unfrequently employed."

ACETAS FERRI. *A. D.* *Acetat of Iron.*

Take of
Precipitated carbonat of iron, . . . half an ounce;
Vinegar, ... three fluid ounces.
Digest for three days and strain.

Dr. Perceval found, in experiments made to determine the comparative solubility of iron, in its different states, in acetic acid, that two drachms of the acid acquired a light amber tinge from ten grains of scales of iron, and left a residuum of 9½; a reddish amber

colour from iron-filings, residuum $6\frac{3}{4}$; a light red from the red oxyd, residuum $8\frac{3}{4}$; and from the precipitated carbonat a deep claret colour, and the whole was dissolved. Hence the last was preferred for making directly an acetat of iron.

Why does not the United States' Pharmacopœia employ the *purified* vinegar for this preparation ?

TINCTURA ACETATIS FERRI. *A. D.*

Tincture of Acetat of Iron.

Take of
Acetat of potass,
Sulphat of iron, each, . . . one ounce ;
Alcohol, ... one pint.

Rub the acetat of potass and sulphat of iron in an earthen mortar until they unite into a soft mass ; dry this with a moderate heat, and triturate it, when dried, with the alcohol. Digest the mixture in a well-corked phial for twenty-four hours, shaking it occasionally. Lastly, after the fæces have subsided, pour off the limpid liquor.

Alcohol is incapable of dissolving the green salts of iron, but dissolves the red salts readily. This tincture contains a very pure acetat of iron, more perfectly neutralized than most metallic salts. Its extract is of a beautiful crimson colour, which does not crystallize, but first assumes the consistence of wax, and then dries transparent, an ounce measure affording ten grains. A drachm measure gave grains $\frac{23}{20}$ of prussiat of iron, by precipitation. Dr. Perceval has commented upon this preparation at considerable length. In the London Pharmacopœia 1746, a *tinctura saturnina* was extracted from a mixture of acetat of lead and sulphat of iron. This was, in fact, a tincture of acetat of iron contaminated with a little lead. Dr. Perceval substituted in his practice a preparation of Glauber's, by using equal weights of acetat of potass and sulphat of iron. This tincture, if made with rectified spirit, grows turbid by keeping, and deposites an oxyd of iron, which does not happen when alcohol, sp. gr. 0.815, is employed, But Mr. Watts discovered, that by using two parts of acetat of potass to one of sulphat of iron, a permanent tincture may be extracted by rectified spirit. Both modes of preparation are inserted in the Dublin Pharmacopœia. That with rectified spirit contains acetat of potass as well as of iron, for its extract is whitish, from a predominance of the former. A drachm measure gave gr. $\frac{16}{20}$ of prussiat of iron, by precipitation. Dr. R. Percival says, it is an elegant, agreeable, and useful chalybeate preparation, of which a tea-spoonful or two may be conveniently taken in asses' milk.

MURIAS AMMONIÆ ET FERRI. *A. D. E.*

FERRUM AMMONIATUM. *L.*

Muriat of Ammonia and Iron. Ammoniated Iron.

FLORES MARTIALES. ENS MARTIS, &c.

Take of
 Red oxyd of iron, washed and again dried;
 Muriat of ammonia, equal weights;
Mix them thoroughly, and sublime.

Although at a low temperature ammonia decomposes the muriat of iron, at a high temperature iron and its oxyds decompose muriat of ammonia. But as muriat of ammonia is itself a volatile salt, great part of it escapes undecomposed; so that the product is a mixture of muriat of ammonia with red muriat of iron. According to the formula of the Edinburgh College, the decomposition is effected by simple affinity. According to the German pharmaceutists, if the iron be equal to one sixteenth of the muriat of ammonia, it is sufficient. The new Prussian Dispensatory directs one ounce of iron to be dissolved in two ounces of muriatic acid, and one of nitrous acid; this solution of red muriat of iron to be mixed with a watery solution of twelve ounces of muriat of ammonia, and the whole evaporated to dryness; and the dry mass to be sublimed in a wide necked retort, with a heat increased to redness.

Whatever process be employed, the heat must be applied as quickly as possible; and the sublimed product thoroughly mixed by trituration, and kept in well-stopt glass vessels. It should have a deep orange colour, and a smell resembling saffron, and should deliquesce in the air.

Medical use.—This preparation is supposed to be highly aperient and attenuating; though no otherwise so than the rest of the chalybeates, or at most only by virtue of the saline matter joined to the iron. It has been found of service in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity, and weakness of the solids, as the rickets. From two or three grains to ten may be conveniently taken in the form of a bolus.

TINCTURA FERRI AMMONIATI. *L.*

Tincture of Ammoniated Iron.

Take of
 Ammoniacal iron, . . . four ounces;
 Proof spirit, ... one pint.
Digest and strain. *L.*

This is merely a spiritous solution of the ammoniacal iron, and is a much less elegant medicine than a simple tincture of muriat of iron.

TINCTURA MURIATIS FERRI. *A. E. L. D.*

Tincture of Muriat of Iron.

Take of
Precipitated carbonat of iron, . . . half a pound;
Muriatic acid, ... three pounds;
Alcohol, ... three pints.

Pour the muriatic acid on the carbonat of iron in a glass vessel; and shake the mixture occasionally during three days. Then set it by, that the fæces, if any, may subside, and pour off the liquor; evaporate this slowly, to one pint, and when cold, add the alcohol.

TINCTURA MURIATIS FERRI CUM OXYDO RUBRO. *D.*

Tincture of Muriat of Iron with the Red Oxyd.

Take of
Red oxyd of iron, ... one ounce;
Muriatic acid, by measure, . . . four ounces;
Rectified spirit of wine, ... the requisite quantity.

Digest the oxyd with the acid for twenty-four hours, then boil for half an hour. Evaporate the filtered liquor to the thickness of syrup, and when cold, add rectified spirit of wine, with frequent agitation, until the tincture acquires the specific gravity of 1050.

In making the first of these tinctures, each of the British Colleges use iron in a different state: the Edinburgh, the black oxyd; the Dublin, the red oxyd; and the London, the carbonat. Mr. Phillips observes, that, although the proportions of the London College answer with muriatic acid of specific gravity 1.17, and per-oxyd of iron, prepared in his method, containing only three *per cent.* of carbonic acid; the solution will have acid in excess, when the muriatic acid has only the strength of 1.142, and the carbonat contains 14.5 *per cent.* of carbonic acid, the common state of these substances, as prepared by the directions of the College. Muriatic acid is capable of combining either with the black or red oxyds of iron, and forms with each, salts, having distinctive properties.

The red muriat of iron is not crystallizable; has a dark orange colour; is deliquescent; forms a brown-red solution, having a very astringent taste; and is soluble in alcohol. The green muriat is crystallizable; has little colour; is very soluble in water, forming a pale green solution; and is insoluble in alcohol. But the aqueous solution of green muriat attracts oxygen so rapidly from the atmosphere, that unless the access of the air be totally excluded, it is always partially converted into red muriat. The solutions of iron, and of its black oxyd, are accordingly found always to contain a greater or less proportion of red muriat, and are, therefore, not uniform or constant in their properties.

"Having prepared this tincture in the proportions of the London Pharmacopœia, with precipitated carbonat of iron, I found," says Dr. Perceval, "that in some instances, when rectified spirit was mixed with the evaporated muriat, crystals of green muriat of iron deposited, which the spirit did not dissolve. The strength of the tincture was consequently variable. This observation suggested the process of tinctura muriatis ferri cum oxydo rubro, which is now inserted amongst the præp. extemp. of the Dublin Pharmacopœia. The muriatic solution is of an orange-red, and does not crystallize when spirit is added.

"Instead of evaporating it to a certain weight, which is a troublesome operation, spirit is added so as to bring the liquor to a certain specific gravity, which is the standard of the strength of the medicine."

It is an excellent chalybeate, and may be given in doses of ten or twenty drops twice or thrice a day, in any proper vehicle.

FERRI PHOSPHAS. *A.* *Phosphat of Iron.*

Take of
Sulphat of iron, . . . four ounces;
Water, ... ten pints.

Dissolve, and allow the solution to remain at rest until the impurities have subsided; then decant the clear liquid. In a separate vessel dissolve four ounces of phosphat of soda, in three pints of water; and mingle the two solutions. Collect the blue powder which is precipitated, place it on a filter, wash it with warm water, until the latter comes off tasteless, and dry the residue with a moderate heat.

We cannot very readily perceive why this article has been introduced as a standard into our Pharmacopœia. Its affirmed powers in cancer, &c. do not seem to have received the sanction of the British physicians generally. It has never, we believe, been introduced into either of the Pharmacopœias; hence we deduce that its benefit is at least problematical. Nor have we heard of that extensive employment of it in this country, which should authorize its adoption at present. Without, however, disputing its powers, we may ask, as it respects its pharmaceutical preparation, what extraordinary advantage is to be derived by using such an immense quantity of water for the solution of the iron, or of the phosphat of soda. As we have frequently prepared it, we may experimentally affirm that a fourth part of the water will be more than sufficient, and the employment of such large vessels as the above requires, will thereby be unnecessary.

FERRI TARTRAS. *A.* Tartras Potassæ et Ferri. *E.* Ferrum Tartarizatum. *L.* Tartarum Ferri. *D.*

Tartrat of Iron. Tartar of (Tartarized) Iron.

Take of
- Carbonat of iron, ... half an ounce;
- Crystals of tartar, in very fine powder, . . . one ounce;
- Distilled water, ... a pint.

Boil them in a glass vessel over a slow fire for an hour, and filter the liquor through paper. When cool, and filtered a second time, evaporate it until a pellicle appears on the surface. In cooling, it will form a saline mass, which is to be powdered, and kept in close vessels. *D.*

This is in fact a triple tartrat of iron and potass, the excess of acid in the super-tartrat of potass being saturated by oxyd of iron. In this process the combination is direct; in that of the London College, the iron is oxydized during the first part of the process in which it is moistened and exposed to the action of the air.

Mr. Phillips has examined this preparation attentively. He says, that, as usually prepared, it has a light green colour, and is readily attracted by the magnet, unalterable by exposure to the air, and with difficulty soluble in water, and that one-fifth of the iron filings employed remain unaltered; so that it must be considered as merely a mixture of metallic iron with super-tartrat of potass, coloured by oxyd of iron.

Dr. Perceval, of Dublin, says, that when prepared according to the directions of the Irish College, and the precipitated carbonat was found to answer best, it forms a mass of concreted spicular crystals of an olive colour, which attracts humidity from the air. In solution it destroys the colour of litmus, and its taste is rather sweetish than sour.

To prepare a real tartarized iron, Mr. Phillips digests 32 parts of filings of soft iron in 64 parts of tartar, adding water occasionally to the mass during the action of the tartar upon the iron, until it appear by the test of litmus paper that the acid is perfectly saturated. During this process, 15 parts of the iron are dissolved, being converted into nearly 22 parts of peroxyd. To this he adds seven times its weight of water, (532 parts,) which easily dissolves the tartarized iron by trituration, forming a solution which readily passes through the filter, and contains one-eighth part of its weight of tartarized iron, or nearly 16 grains of oxyd in the fluid ounce. This solution is of a deep greenish-brown colour, and remains for a great length of time without undergoing any change, (except at first the deposition of the tartrat of lime of the tartar.) It is precipitated by alcohol, and decomposed by lime-water, by solutions of potass and soda and their subcarbonats, when heated, but not when cold; nor by ammonia or its subcarbonat, hot or cold. It is not crystallizable, but

when dried, is of a dark greenish-brown colour, and attracts moisture from the atmosphere, but does not deliquesce; is exceedingly tenacious, resembling gum, and can scarcely be made to form a perfect solution.

It is evident, that, when properly prepared, tartarized iron cannot be exhibited in powder as commonly directed, and the advantage of exhibiting this preparation in solution is, that when the acid is perfectly saturated, the taste of the iron is scarcely perceptible; and hence it can be exhibited with success to persons to whom the common solutions of iron are nauseous. It deserves notice, that when there is acid in excess, the taste of the iron is much more easily detected.

PRUSSIAS FERRI. *A.* *Prussiat of Iron.*

By this we presume is meant the Prussian blue of commerce. It is always prepared in the large way, and it has already been spoken of in the consideration of Prussic acid, under the head of Cyanogen. It is intended by the Pharmacopœia only as the intermedium by which to obtain the acid.

VINUM FERRI. *A. L. D.* *Wine of Iron.*

Take of
Iron wire cut in pieces, ... four ounces;
Wine, ... four pints.

Sprinkle the wire with two pints of the wine, and expose it to the air until it be covered with rust; then add the rest of the wine; macerate for ten days, with occasional agitation, and filter.

In this preparation, which is taken from the Dublin College, there appears a very useless expenditure of the wine, in making it the medium of oxydizing the iron. The London formula is superior, in which only half the amount of the ingredients are used, and without the loss abovementioned. It would probably be better to employ the oxyd of iron in place of the metal itself.

FICUS. *A. E. D. L.*

Fig Tree. Figs. The Preserved Fruit.

This tree is probably a native of Asia, but grows plentifully in the south of Europe. As the fruit is very pulpy, it is dried when it is to be preserved. To this country they are chiefly brought from the Levant. They consist almost entirely of sugar and mucilage, and are therefore demulcent. They are also esteemed by some as

suppuratives; and they are sometimes applied by themselves, heated as warm as they can easily be borne, to promote the suppuration of a phlegmon, particularly when so situated that other cataplasms cannot easily be kept applied.

Figs ripen very well by the middle of September in Philadelphia, when enjoying a free exposure to the sun. In the Southern states they flourish luxuriantly, and might become an article of extensive exportation, and home consumption, if pains were taken to introduce the large Levant fig.

As an agreeable article for eating, we all can appreciate the fig; but whether as a maturating cataplasm, it is any way superior to a common bread and milk poultice, we may be allowed to doubt. At any rate it would be better located amongst the secondary than the *standard* articles of the Materia Medica.

FRASERA. *A.*

FRASERA WALTERI. FRASERA CAROLINIENSIS.

American, or Marietta Columbo. The Root.

This plant is nearly allied in botanical habits, to the genus Gentiana. It is a native of the states of New York, Carolina, &c. and is furnished with a large tuberous root, of a yellow colour, which promises to be little inferior, as a bitter, to the gentian of the shops.*

This species of Columbo is produced in the vicinity of Marietta in Ohio, and we are indebted to Dr. S. P. Hildreth of that place for a partial description of the plant. According to him the Columba Americana is a regular and very elegantly proportioned plant, growing to the height of seven feet.

It is a production of high land, a rich and loamy soil that is covered with white oak, white thorn, and tufts of prairie grass. The stalk is covered with a smooth delicate membrane of a deep purple colour at the root, but becoming lighter as it ascends towards the top. Beneath this is a pulpy coat, fibrous and vascular, which covers another that is entirely ligneous, which is the chief support of the stalk. The remainder is medullary, and completely fills the woody circle. The columbo of Marietta is a triennial plant. The radical leaves, when it springs from the seed, are five in number, to these are added the second season five more. The third spring it sends up a stalk with five whorls of leaves, when each whorl consists of *five leaves,* and *four,* when each whorl consists of *four,* before it puts out any flowering branches. The leaves are in whorls smooth and spear shaped. The branches are axillary, upright, and of the same number with the leaves, from the basis of which they immediately rise and send out opposite fruit stalks. From the whorls where

* Barton's Collections, Part II. p. 16.

the flowering branches commence to the top of the stalk, if it consists of five leaves, there are ten whorls growing gradually less to the apex, which ends with five peduncles. It flowers in July. The root, as soon as it enters the earth, shoots out in a horizontal direction; is spindle-shaped; and when well grown is from eighteen to thirty inches in length, and two in diameter at the turn. Near the surface of the earth the root is wrinkled ; its colour in the young plant is a light yellow; and is solid and brittle. After the stalk is grown the root becomes softer and less bitter. The proper time for collecting it seems to be in the spring of the third year. Dr. Hildreth asserts that, from the experiments he has made with American columbo, he is induced to believe it fully equal, if not superior to the imported. It is in common use there, and has, in one instance, in the heat of summer, put a stop to a wide spreading gangrene, on one of the lower extremities, by internal use and external application, when bark and other remedies had failed.

The columbo plant is undoubtedly to be estimated as a valuable acquisition to our Materia Medica. The root, however, is found on examination to be of a lighter colour, and to possess less of the bitter principle than the imported root; its comparative efficacy is therefore doubtful, and yet to be ascertained.

FUCUS VESICULOSUS. *L. D.*

Yellow Bladder Wrack.

This is one of the most common sea-weeds found on the shores of Great Britain. Its value in the manufacture of kelp is well known. In medicine it is little used ; but the charcoal obtained by burning it in close vessels has in some places got the name of Æthiops vegetabilis. It is to be considered as a compound of charcoal and carbonat of soda.

Dr. Russel recommended the mucus of the vesicles as a resolvent, when externally applied to scrofulous swellings. It is probable its efficacy may depend on the iodine it contains.

FULIGO LIGNI COMBUSTI. *D.* *Wood-soot.*

This substance is inflammable, of a shining black colour, a disagreeable smell, and an empyreumatic, bitter, nauseous taste.

It varies somewhat according to the nature of the substance, and the strength of the fire employed in its production. But it consists principally of charcoal, empyreumatic oil, and acetic acid. It sometimes contains ammonia, and the other alkalies and earths. Its medical properties are to be ascribed solely to the empyreumatic oil it contains.

G.

GALBANUM. *A.* Bubon Galbanum. *E. D. L.*

Galbanum. The Gum Resin.

This plant is perennial, and grows in Africa. It abounds with a milky juice, which sometimes exudes from the joints of the old plants, but is more frequently obtained by cutting them across some inches above the root. The juice which flows from the wound soon hardens, and is the galbanum which is brought to us from Syria and the Levant.

The best sort of Galbanum consists of pale coloured pieces, about the size of a hazel nut, which on being broken, appear to be composed of clear white tears, of a bitterish acrid taste, and a strong peculiar smell. But it most commonly occurs in agglutinated masses, composed of yellowish or reddish and clear white tears, which may easily be torn asunder, mixed with seeds and leaves, of the consistence of firm wax, softening by heat, and becoming brittle by cold. What is mixed with sand, earth, and other impurities, and is of a brown or blackish colour, interspersed with no white grains, of a weak smell, and of a consistence always soft, is bad.

Galbanum is almost entirely soluble in water, but the solution is milky; neither does wine nor vinegar dissolve it perfectly. Alcohol, according to Hagen, has very little action upon it. It is not fusible; but furnishes a considerable proportion of essential oil when distilled with water. Neumann obtained from a pound of galbanum by distillation with water six drachms of oil, besides what was dissolved in the water. The watery extract amounted to about three ounces. It had somewhat of a nauseous relish, but could not have been recognized as a preparation of galbanum. From the same quantity alcohol extracted upwards of nine ounces and a half of a hard brittle insipid inodorous substance (resin?)

Medical use.—Galbanum agrees in virtue with gum ammoniacum; but is generally accounted less proper in asthmas, and more so in hysterical complaints. It is exhibited in the form of pills or emulsions, to the extent of about a drachm. Applied externally, it is supposed to resolve and discuss tumours, and to promote suppuration.

GALEGA VIRGINIANA. *Virginia Goats-rue. The Root.*

This is one of the most beautiful of the known North American plants of the class Diadelphia. It is common in many parts of Penn-

sylvania, New Jersey, &c. It is called cat-gut in Jersey, from the resemblance of its roots to that article. A decoction of the roots is a powerful anthelmintic.*

GALLÆ. *A. E. D. L.*

Nut-galls. The Nest of the Cynips Quercifolii.

Olivier has, in his travels in the Ottoman empire, given us an accurate botanical description of the oak which produces the gall-nut, and which, he says, was till then unknown to botanists. He calls it *Quercus infectoria*, and characterizes it *foliis ovato oblongis, sinuato dentatis, glaberrimis, deciduis ; fructibus sessilibus, longissimis*. It is scattered through all Asia Minor, from the Bosphorus to Syria, and from the shore of the Archipelago to the frontiers of Persia. It has a crooked stem, and seldom reaches the height of six feet. It oftener has the appearance of a shrub than of a little tree. The gall-nuts come at the shoots of the young boughs, and are produced by the puncture of *diplolepis gallæ tinctoriæ* to deposite an egg. They acquire from four to twelve lines in diameter, and are generally round and covered with tuberosities. They are in perfection when they have acquired their full size and weight, but before the insect has pierced them, after which they get a brighter colour, and lose some of their weight. The harvest takes place about the middle of *Messidor*. The galls first picked are laid apart, and are known under the name of *Yorli*, and in commerce are called *black* and *green* galls. Those gathered later are called *white* galls, and are very inferior in value. In commerce they occur of different sizes, smooth or knotty on the surface, of a whitish, reddish, or blackish colour, and generally penetrated with a small hole. Internally they consist of a spongy, but hard, more or less brown substance, and they have a very rough astringent taste. Good galls are of a blackish-grey, or yellow colour, heavy, and tuberculated on the surface. They are the most powerful astringents we possess ; and since the discovery of the tanning principle by Mr. Seguin, have very much engaged the attention of chemists. Neumann got from 960 grains of coarsely powdered galls, 840 watery extract, and afterwards only 4 alcoholic ; and inversely, 760 alcoholic, and 80 watery. But the most minute analysis is that of Sir H. Davy, who found that 500 grains of good Aleppo galls gave, by lixiviating them until their soluble matters were taken up, and evaporating the solution slowly, 185 grains of solid matter, which, when examined by analysis, appeared to consist of,

* Barton's Collections, Part I. p. 64.

Tannin,*	130
Mucilage, and matter rendered insoluble by evaporation,	12
Gallic acid,† and a little extractive matter,	31
Remainder, calcareous earth and saline matter,	12.

From his experiments, Dr. Duncan is disposed to think that Sir H. Davy has under-rated the tannin of nut-galls; for by simple repeated infusions in hot water, the residuum of 500 grains in one experiment amounted only to 158, and in another only to 136 grains. The quantity of tannin, estimated in Sir H. Davy's way, amounted, in the first, to 220 grains, and in the second, to 256. The great difference in these results from Sir H. Davy's, must be entirely ascribed to some differences in the galls themselves, or in the mode of operation. A saturated decoction of galls, on cooling, deposites a copious pale yellow precipitate, which seems to be purer tannin than what can be got by any other process; but it still requires and deserves a more minute examination. In Dr. Duncan's experiments, a very weak infusion of nut-galls was precipitated by sulphuric acid, lime-water, sub-carbonat of potass, acetat of lead, sulphat of copper, nitrat of silver, sulphat of iron, tartrat of antimony, nitrat of mercury, infusion of officinal cinchona, and solution of gelatin; it was not precipitated by nitrous acid, ammonia, sulphat of zinc, muriat of mercury, infusion of quassia, or infusion of saffron. To what principles these precipitates are owing, remains still to be ascertained. Vauquelin justly observes, that the infusions of nut-galls and of cinchona agree in precipitating both gelatin and tartrat of antimony, but that they precipitate each other. Another fact, equally curious, occurred in Dr. Duncan's experiments: a mutually saturated mixture of the infusions of nut-galls and cinchona, still precipitates gelatin; but these infusions, separately saturated by gelatin, do not act on each other. Hence it appears, that the action of these infusions on each other, depends on principles contained in each, compatible with the presence of tannin, but re-acting on each other, and that gelatin precipitates these principles along with the tannin. Sir H. Davy has concluded that tannin and gelatin unite in fixed proportions, viz. 46 of tannin with 54 gelatin: were this correct, it would very much facilitate the analysis of astringents, but unfortunately Dr. Duncan's experiments do not confirm it. A

* *Tannin*, when completely dried, is a brittle substance, of a black colour, and vitreous fracture; it is soluble in alcohol; it is much more soluble in hot than in cold water. The solution has a dark brown colour, astringent taste, and peculiar smell; it is precipitated by acids, in the form of a viscid fluid, like pitch: it is also precipitated by carbonat of potass in yellow flakes; it forms an insoluble elastic precipitate with gelatin, and dark blue or black precipitates with iron.

† *Gallic acid* crystallizes in brilliant colourless plates, of an acid and somewhat austere taste, and of a peculiar odour when heated. It may be sublimed without alteration, although a strong heat decomposes it in part. It is not altered by exposure to the air, is soluble in 1 1-2 of water at 212°, and in 12 waters at 60°, and in four times its weight of alcohol. It has a strong affinity for metallic oxyds, especially iron. It precipitates gold, copper and silver brown, mercury orange, iron black, bismuth yellow, and lead white.

Gallats have not been examined.

twelve hours' infusion of 500 grains of nut-galls in twelve ounces of water, precipitated successively with equal quantities of solution of gelatin, containing each twenty-four grains, gave precipitates weighing 98, 64, 48, and 36 grains: hence, if we suppose the whole gelatin used to be contained in each precipitate, these consisted of 24 grains of gelatin, and 74, 40, 24, and 12 grains of tannin; so that, from the weight of the precipitate alone, we cannot estimate the tannin. Dr. Bostock has drawn the same conclusions from a set of experiments which he made, without any knowledge of Dr. Duncan's. It has been generally asserted, that the precipitate of tannin and gelatin is insoluble in water, either cold or hot; but Dr. Duncan found that in boiling water it not only becomes soft and viscid, but a certain portion is dissolved, which separates again when the solution cools. He also remarks, that if the precipitate be dried without any heat, it has a yellowish-white appearance, opaque, and without lustre; but if exposed to a very moderate increase of temperature before it be dry, it seems to undergo a kind of fusion, and acquires transparency, a dark brown-red colour, and a resinous lustre; with a higher temperature, even when almost dry, it will become so fluid as to pass through filtering paper. Mr. Davy discovered that it is soluble in excess of gelatin. It is also extremely soluble in ammonia, forming a red solution.

Medical use.— An infusion or decoction of galls may be used with advantage as an astringent gargle; and an ointment of one part of finely powdered galls to eight of any simple ointment is applied with success in hæmorrhoidal affections.

GAMBOGIA. *A. E. D. L.* *Gamboge.*

The Gum Resin of the Stalagmitis Gambogioides, and some other trees.

The tree which furnishes the gamboge is of middling size, and grows wild in the kingdom of Siam and in Ceylon. In Siam the gum-resin is obtained in drops by breaking the leaves and young shoots; hence probably its name gummi-guttæ; but in Ceylon it is extracted from the wood of the tree in the form of a juice, which soon becomes solid. Gamboge, or at least a very similar substance, is also got in the same way from different species of Garcinia, especially the Gambogia, (the Gambogia Gutta of Linn.) *Willd. g.* 938, *sp.* 3. *Dodecandria Monogynia,* and from different species of Hypericum, especially the Bacciferum. It is brought from the East Indies in large cakes or rolls. The best sort has a deep yellow or orange colour, shining fracture, and is free from impurities. It has no smell, and very little taste, unless kept in the mouth for some time, when it impresses a slight sense of acrimony. Neumann got from 16 ounces, 14 of alcoholic extract, and one of watery; and inversely, 13 of

watery, and two of alcoholic. He also found it almost entirely soluble in water, impregnated with a moderate proportion of fixed alkaline salt. According to Dr. Duncan's experiments, which confirm these observations, the watery solution is opaque and yellow. With alcohol it forms a transparent solution of a bright golden colour; and the residuum is totally soluble in water. The alcoholic solution is decomposed by water, becoming yellow and opaque; but the precipitate remains long suspended, and cannot be separated by common filtering paper. Ammoniated alcohol dissolves gamboge with similar phenomena. Gamboge is readily soluble in solution of potass, acquiring a bright red colour the moment it is thrown into it, and forming a dark-coloured solution, which is not decomposed by water; but the addition of any acid immediately produces a copious yellow precipitate, very soluble in excess of acid. Gamboge is also very soluble, but with decomposition, in acids. The acid solution is precipitated by water. Bracconot says it consists of one-fifth of gum, and four-fifths of an acidiferous resin, from which he extracted, by analysis, 22.5 dry muriatic acid, 35 charcoal, 42 gases. This requires to be confirmed.

Medical use.—Gamboge evacuates powerfully, both upwards and downwards; some condemn it as acting with too great violence, and occasioning dangerous hypercatharsis; while others are of a contrary opinion. Geoffroy seems particularly fond of this medicine, and informs us, that he has frequently given from two to four grains, without its proving at all emetic; that from four to eight grains both vomit and purge without violence; that its operation is soon over; and that if given in a liquid form, and sufficiently diluted, it does not need any corrector; that in the form of a bolus or pill, it is most apt to prove emetic, but very rarely has this effect if joined along with *calomel.* He nevertheless cautions against its use where the patients cannot easily bear vomiting.

It has been used in dropsy with cream of tartar or jalap, or both, to quicken their operation. It is also recommended by some to the extent of fifteen grains, with an equal quantity of vegetable alkali, in cases of the tape-worm. This dose is ordered in the morning; and if the worm is not expelled in two or three hours, it is repeated even to the third time with safety and efficacy. It is asserted, that it has been given to this extent even in delicate habits.

It is an ingredient, and probably the active one, in most of the nostrums for expelling tæniæ.

GAULTHERIA. *A.* (*Secondary.*)

Mountain-tea. Partridge-berry. The Leaves.

It is also called berried-tea, grouse-berry, and deer-berries; and is one of the principal articles of the materia medica of some Indian

tribes. It is extensively spread over the more barren, mountainous parts of the United States. In infusion it possesses a stimulant and anodyne quality, and is said to be useful in cases of asthma.*

GENTIANA. *A.* GENTIANA LUTEA. *E. L. D.*

Gentian. The Root.

Gentian is a perennial plant, which grows upon the Alps, Pyrenees, Appenines, and other mountainous situations in the temperate parts of Europe.

The roots are long, thick, externally of a brown colour, and wrinkled; internally spongy, and of a yellow colour, without any remarkable smell, but surpassing in bitterness all other European vegetables. Alcohol dissolves only the bitter extractive, water both the extractive and mucilage.

Neumann got from 960 grains 390 alcoholic, and afterwards 210 insipid watery extract, and inversely 540 watery, and only 20 alcoholic.

Medical use.—Gentian possesses the general virtues of bitters in an eminent degree, and is totally devoid of astringency. On dead animal matter it acts as an antiseptic. Taken into the stomach, it proves a powerful tonic, and in large doses it evacuates the intestines. It is useful in debility of the stomach, in general debility, and in gout. Combined with astringents it cures intermittents. Externally, it is applied to putrid ulcers.

GENTIANA CATESBÆI. *A.* (*Secondary.*)

Blue Gentian. The Root.

This plant is pre-eminent in the bitterness of its roots, which are branching, and somewhat fleshy. When dried, it has at first a mucilaginous and sweetish taste, which is soon followed by an intense bitter, nearly approaching that of the officinal gentian. This quality, according to Professor Bigelow, appears to reside in a bitter extractive principle, soluble both in water and in alcohol. A little resin is also present. Both the alcoholic and watery solutions exhibit the bitterness more powerfully than the root in substance. It has no astringency.

It is used in the Southern States in decoction, in pneumonia, as a tonic and sudorific. Its tincture is used in dyspepsia, from two drachms to half an ounce. It may be considered as useful in all cases where a pure and simple bitter is indicated.

* Barton's Collections, Part I. p. 19.

GEOFFRÆA INERMIS. *E. D.*

Cabbage-tree. The Bark.

The bark of this tree, which grows in the low savannas of Jamaica, is of a grey colour externally, but black and furrowed on the inside. The powder looks like jalap, but is not so heavy. It has a mucilaginous and sweetish taste, and a disagreeable smell.

Medical use.—Its medical effects are much greater than its sensible qualities would lead us to expect. It is given in cases of worms, especially for lumbrici, in form of powder, decoction, syrup and extract. The decoction is preferred; and is made by slowly boiling an ounce of the fresh dried bark in a quart of water, till it assume the colour of Madeira wine. This, sweetened, is the syrup; evaporated, it forms an extract. It commonly produces some sickness and purging; sometimes violent effects, as vomiting, delirium, and fever. These last are said to be owing to an over-dose, or to drinking cold water; and are relieved by the use of warm water, castor oil, or a vegetable acid.

GERANIUM. *A.* Geranium Maculatum.

Cranes-bill. Spotted Geranium. The Root.

This is improperly called crow-foot in some parts of the United States. It grows plentifully about Philadelphia. The root, boiled in milk, is an excellent medicine in the cholera of children. In Kentucky it has been collected for the tormentil of the shops. It is called in some of the north-western parts of the United States, *Racine à Becquet,* after a person of this name. The western Indians say it is the most effectual of all their remedies for the cure of the venereal disease.

An aqueous infusion of the roots forms an excellent injection in gonorrhœa, and old gleets.*

Dr. Mease mentions its efficacy in stopping bleedings, by applying the root to the bleeding orifice.†

* Barton's Collections, Part I. p. 8, 43. Part II. p. 1.

† Philadelphia Medical Museum, vol. ii. p. 163.

GEUM. *A.* (*Secondary.*) Geum Rivale.

Water Avens. The Root.

Geum Urbanum. *D.*

Common Avens. Herb Bennet. The Root.

Avens is a common perennial plant in shady uncultivated places, and flowers from May to August. The root is fibrous, externally of a dark red colour, internally white, and has the flavour of cloves, with a bitterish astringent taste. Its virtues are said to be increased by cultivation, and the large roots are preferred to the smaller fibres. It must be dug up in the spring, when the leaves begin to appear, for the smell is then strongest; indeed it is hardly to be perceived when it flowers. It must be dried in the air, but not with a strong heat, as its flavour would be dissipated, and its virtues diminished. It tinges both water and alcohol red. Half an ounce yielded 30 grains of resinous, and 20 of gummy extract; the former had the smell of the root, the latter was without smell, and merely astringent. Water distilled from it has a pleasant flavour, and carries over a little thickish essential oil. It has been more recently analyzed by Melandri and Moretti, who got from two ounces 118 grains of tannin, 181 extractive, 61 of saponaceous extract and saline matter, 92 of mucous extract, 23 of resin, 496 of woody fibres, and 76 of volatile oil, water and loss.

Medical use.—Avens is an old febrifuge mentioned by Ray, but again brought into notice by Buckhave. It is recommended as a substitute for cinchona, in intermittent fevers, dysentery, and chronic diarrhœas, flatulent colic, affections of the primæ viæ, asthmatic symptoms and cases of debility. Half a drachm or a drachm of the powder may be given four times a-day, simply, or made up into an electuary with honey or rhubarb. Two table spoonfuls of the decoction may be given every hour; or a table spoonful of a tincture, made with an ounce of the root to a pint of alcohol, three or four times a day.

GILLENIA. *A.* Gillenia (Spiræa) Trifoliata.

Common Gillenia. Indian Physic, &c. &c.

This shrub grows plentifully in the United States, and is one of the few active plants of the class Icosandria. The root, the part employed, consists, like that of the officinal ipecacuanha, of a bark, and woody part. The active power seems to reside exclusively in the bark. It is a safe and efficacious emetic in doses of about 30 grains. It also seems to possess a tonic power, and has accordingly been thought peculiarly beneficial in intermittent fever. It is sometimes very injudiciously employed by the country people, insomuch that they are obliged to apply for medical aid to remove the debility in-

duced by the large doses of the root which they employ. Another species, it is said, grows in Kentucky, which is still more valuable, as an emetic, than the one under notice.*

Professor Bigelow in speaking of the gillenia, says, he can add his own testimony to its possessing properties analogous to those of ipecacuan. It requires, however, (he adds) a larger dose, and he has not been satisfied, *that it is at all certain* in its operation.

In small doses, like ipecacuan, it appears to possess a tonic power; there does not seem any reason, from what is stated of this article, to conclude that it can supersede the foreign ipecacuan.

GLYCYRRHIZA. *A. E. L. D.*

Liquorice. The Root and Extract.

Liquorice is a perennial plant, and a native of the south of Europe, but it is cultivated in considerable quantities in England for medical purposes; and the roots which are raised there, are preferred to those imported from abroad, which are very frequently mouldy and spoiled, which this root is extremely apt to be when not well preserved in a perfectly dry place. The roots are very long, about an inch thick, flexible, fibrous, externally of a brown colour, internally yellow, and, when fresh, juicy. Their taste is very sweet, combined with a slight degree of bitter, when long kept in the mouth. They are prepared for use by peeling them, cutting away all the fibres and spoiled or mouldy parts.

The powder of liquorice usually sold is often mingled with flour, and perhaps also with substances not quite so wholesome: the best sort is of a brownish yellow colour, the fine pale yellow being generally sophisticated, and it is of a very rich sweet taste, much more agreeable than that of the fresh root.

Neumann got from 960 parts of dried liquorice, 300 alcoholic extract, and afterwards 210 watery, and inversely 540 watery, and only 30 alcoholic. The original alcoholic extract is the sweetest.

Robiquet obtained from liquorice root, 1. Amylaceous feculum; 2. A saccharine substance having no resemblance to sugar; 3. A new crystalline substance; 4. A resinous oil, which is the cause of the acrimony in the decoctions; 5. Phosphat and malat of lime and magnesia; 6. Woody fibre.

Medical use.—Its predominant constituents being saccharine and mucilaginous matter, its only action is that of a mild demulcent, and as such it is frequently used in catarrh, and in some stomach-complaints, which seem to arise from a deficiency of the natural mucus, which should defend the stomach against the acrimony of the food, and the fluids secreted into it.

On account of its bulk it is rarely exhibited in substance, but more frequently in infusion or decoction.

* Barton's Collections, Part I. p. 26. Part II. p. 59.

EXTRACTUM GLYCYRRHIZÆ. *Extract of Liquorice.*

As this extract is never prepared by the apothecary, but commonly imported from other countries, the Edinburgh college have inserted it in their list of the materia medica. It is imported in cylindrical rolls, covered with bay-leaves. It should be perfectly black, brittle when cold, and break with a smooth and glossy fracture, have a sweet taste, without empyreuma, and be entirely soluble in water. It is prepared from the fresh roots by expression, decoction, and inspissation.

The best foreign extract of liquorice is prepared in Catalonia, but it is not so pure or so agreeable as the refined liquorice sold in the shops in small cylindrical pieces, not thicker than a goose-quill.

This article is much employed in cases of catarrh, &c. in combination with other substances, as paregoric elixir, &c. to allay the cough. It is troublesome to dissolve it in water in the solid masses in which we receive it. An excellent mode of keeping it for use, is to pulverize it in very cold weather, and mix it with about one-fifth part of the powdered root, which prevents its agglutinating; and a mixture is readily made with it, even in cold water.

Neumann got from 480 parts of Spanish extract, 460 watery extract, and the residuum was not affected by alcohol; and inversely he got 280 alcoholic, and 180 watery extract. In this last case the alcoholic extract contained all the sweetness, the watery having scarcely any taste. From the similarity of their taste, Dr. Thomson has made it a species of his new genus sarcocoll, but Neumann's more accurate analysis shows that it is a compound.

The extract possesses the same properties with the root, and is used for the formation of several kinds of troches.

The use of liquorice in preventing the tormina from senna, has been adverted to.

GRANATUM. *A.* (*Secondary.*) PUNICA GRANATUM. *E. L. D.*

Pomegranate. The Rind of the Fruit.

The Double Flowers called Balaustine. D.

The pomegranate is a low tree, or rather shrub, growing wild in Italy and other countries in the south of Europe; it is sometimes met with in our gardens; but the fruit, for which it is chiefly valued, rarely comes to perfection. This fruit has the general qualities of the other sweet summer fruits, allaying heat, quenching thirst, and gently loosening the belly. The rind is a strong astringent, striking a permanent blue with sulphat of iron, and as such is occasionally made use of. It has been lately given by Dr. Buchanan with success in the East Indies for the cure of tænia. Dr. Duncan also made some trials of it and of catechu in Great Britain, on the supposition that it was the astringent principle which acted chemically on the gela-

tinous body of the worm, and the result was promising; but the introduction of the oil of turpentine prevented him from prosecuting the experiment. The flowers are of an elegant red colour, in appearance resembling a dried red rose. Their taste is bitterish and astringent. They are recommended in diarrhœas, dysenteries, and other cases where astringent medicines are proper.

GUAIACUM. *A. Lignum et Resina.*

Guaiacum Wood or Lignum Vitæ, and Resin of Guaiacum.

Guaiacum Officinale. *E. L. D.*

Guaiac. The Wood and Gum Resin.

This tree is a native of the West Indies, where it grows to a middling size. The wood is heavier than water, very hard, resinous, and of a greenish black colour. Its taste is bitterish, and when kindled it gives out a pleasant smell. It is brought either in pieces, which are sometimes covered with a pale yellow alburnum, or already rasped, when by division its colour appears greenish, brown, or yellow. The bark is thin, of an ash-grey or blackish colour, and apparently composed of several laminæ. It is less resinous than the wood. Neumann got from 7680 parts of the wood, 1680 alcoholic, and 280 watery extract, and inversely 740 watery, and 960 alcoholic; from 3840 of the bark he got 560 alcoholic, and 320 watery, and inversely 620 watery, and 240 alcoholic. The resin exudes spontaneously in tears, but is principally obtained by sawing the wood into billets about three feet long, which are then bored with an auger longitudinally. One end of these is laid upon a fire, so that a calabash may receive the melted resin, which runs through the hole as the wood burns. It may be also obtained by boiling the chips or sawings of the wood, in water and muriat of soda. The resin swims at the top, and may be skimmed off.

Guaiac resin has a brownish yellow colour externally; when held against the light is transparent, breaks with an uniform smooth shining fracture, of a bluish-green colour, is pulverizable, and the powder has a white colour, gradually becoming bluish-green; is fusible in a moderate heat, but not softened by the heat of the fingers; without proper smell and taste, but when thrown on hot coals diffusing an agreeable odour, and when swallowed in a state of minute division, causing an insufferable burning and prickling in the throat. Its specific gravity is 1.23. Neumann got from 480 parts, 400 alcoholic, and only 10 watery extract; and inversely, 80 watery, and 280 alcoholic. Mr. Brande has more lately investigated this substance with much care. Digested with water, about one-tenth of it is dissolved, the water acquiring a sweetish taste and greenish-brown colour. The liquid, when evaporated, leaves a brown substance, soluble in hot water and alcohol, but scarcely in sulphuric ether, and precipitating the muriats of alumina and tin. Alcohol readily forms with

guaiac a deep brown-coloured solution, rendered milky by water, and precipitated pale green by the muriatic and sulphuric acids, brown by the nitric, and pale blue by the oxy-muriatic, but not by the acetic acid or by alkalies. The solution in ether exhibits nearly the same properties. Guaiac is soluble in about 15 parts of solution of potass, and in 38 of ammonia; and the solutions are precipitated by the nitric, muriatic, and diluted sulphuric acids. Sulphuric acid dissolves it, and nitric acid converts it into oxalic acid. On being burnt it leaves a large proportion of charcoal. Dr. Wollaston has discovered a curious property of guaiac. By exposure to air and light, it acquires a green colour. This effect is produced in the greatest degree by the most refrangible rays. In the least refrangible rays it is deoxydized, and the yellow colour is restored. The same effect is produced by hot metal. According to this analysis, it differs from the resins in the changes of colour produced on it by air and light, and the action of the acids, in not forming tannin but oxalic acid when treated with nitric acid, and in the large proportion of charcoal it affords when burnt. It is sometimes adulterated with colophony or common resin; but the fraud is easily detected by the smell of turpentine emitted when thrown on live coals.

Medical use.—Taken internally, guaiac commonly excites a sense of warmth in the stomach, a dryness of the mouth, with thirst. It increases the heat of the body, and quickens the circulation. If the patient be kept warm, it produces diaphoresis; if exposed freely to the air, an increased flow of urine. In large doses it is purgative.

Guaiac is a useful remedy,

1. In rheumatism and gout.
2. In certain venereal symptoms, as in foul indolent ulcers, and a thickened state of the ligaments or periosteum, remaining after the body is reduced by a mercurial course. Guaiac will also suspend the progress of some of the secondary symptoms; but it is totally incapable of eradicating true syphilis.
3. In cutaneous diseases.
4. In ozena, and scrofulous affections of the membranes and ligaments.

The wood is always exhibited in decoction. From the resinous nature of the active constituent of this substance, this cannot be a very active preparation, as the menstruum is totally incapable of dissolving, though it may suspend a little of the resin. The decoction of an ounce may be drank in cupfuls in the course of a day.

The resin may be exhibited,

1. In substance, either made into pills, or suspended in water in the form of an emulsion In this way from 10 to 30 grains of the resin may be taken in the day.
2. In solution in alcohol. About half an ounce of the tincture, with three ounces of water, is a sudorific dose for an adult, if he attend to keeping himself warm.
3. Combined with an alkali.

H.

HAMAMELIS VIRGINIANA. *Witch Hazel. The Bark.*

This tree is a native of the United States. The leaves are nearly inversely ovate. Blossoms, yellow: stand three or four together on short flower stalks. In loamy land. Blossoms, September and October. This singular shrub does not commonly bloom until its leaves are destroyed by frost, when its numerous blossoms make a gay and agreeable appearance, and continue until the weather becomes very cold, often until snow falls. The germen endures the severity of our winters uninjured; for the fruit does not ripen until the next September, the time of its blossoming again, when ripe fruit and blossoms will be found on the same tree. The Indians consider this tree as a valuable article in their *Materia Medica.* They apply the bark, which is sedative and discutient, to painful tumours and external inflammations. A cataplasm of the inner rind of the bark, is found to be very efficacious in removing painful inflammations of the eyes. The bark chewed in the mouth is, at first, somewhat bitter, very sensibly astringent, and then leaves a pungent, sweetish taste, which will remain for a considerable time. The specific qualities of this tree seem by no means to be accurately ascertained. It is probably possessed of valuable properties.

HÆMATOXYLON. *A.* Hæmatoxylon Campechianum. *E. D. L.*

Logwood. The Wood.

This tree was introduced from the Honduras into Jamaica, where it is now very common. The wood is firm, heavy, and of a dark red colour. Its taste is sweet, with a slight degree of astringency. It forms a precipitate with solution of gelatin, very readily soluble in excess of gelatin, and Dr. Duncan says, that with sulphat of iron it strikes a brighter blue than any other astringent he tried. It is used principally as a dye-wood, but also with considerable advantage in medicine.

Its extract is also sweet and slightly astringent; and is, therefore, useful in obstinate diarrhœas, and in chronic dysentery.

HELLEBORUS FŒTIDUS. *A. L. D.*

Bears-foot. Stinking Hellebore. Settiswort. The Leaves.

This species is a native of England. It is perennial, and grows in shady places, and under hedges. The leaves have an acrid, bitter, nauseous taste, and unpleasant smell, especially when they are fresh. When dried, they are frequently given as a domestic medicine to destroy worms; but they must be used sparingly, being so violent in their operation that instances of their fatal effects are recorded.

HELLEBORUS NIGER. *A. E. L. D.*

Black Hellebore. The Root.

This plant, formerly called *Melampodium*, is perennial, and grows wild in the mountainous parts of Austria, and on the Pyrenees and Appenines: the earliness of its flowers, which sometimes appear in December, has gained it a place in gardens.

The roots consist of a black furrowed roundish head, about the size of a nutmeg, from which short articulated branches arise, sending out numerous corrugated fibres about the thickness of a straw, from a span to a foot in length, deep brown on the outside, white, or yellowish-white within, and of an acrid, nauseous and bitterish taste, exciting a sense of heat and numbness in the tongue, and of a nauseous acrid smell. These fibres only are used in medicine, and the head, and decayed parts are rejected. For the roots of the real black hellebore, the roots of the Adonis vernalis, Trollius Europæus, Actæa spicata, Astrantia major, Helleborus viridis fœtidus, Veratrum album, and Aconitum neomontanum, are often substituted. The last is a most virulent poison, and may be distinguished by its roots being fusiform, or nearly globular, sending out numerous very brittle fibres, of a greyish black or brown colour, as thick as a man's finger, and repeatedly divided. But the surest way to avoid mistakes, is by the apothecary cultivating the plant itself in his own garden.

Neumann got from 2880 grains, 380 alcoholic, and 181 watery extract; and inversely 362 watery and 181 alcoholic.

Medical use.—In large doses, hellebore is a drastic purgative; in smaller doses it is diuretic and emmenagogue.

It is principally used as a purgative in cases of mania, melancholy, coma, dropsy, worms and psora, and as an emmenagogue. But its use requires very great caution, for its effects are very uncertain, and affected by many circumstances.

It is commonly exhibited in the form of extract, although its activity be much dissipated by the preparation. An infusion or tincture certainly promise to be medicines of more uniform powers. Willdenow says, that the black hellebore of the ancients is his fifth species, the Helleborus orientalis.

HERACLEUM LANATUM. *A.* (*Secondary.*)
Masterwort. The Root.

HERACLEUM SPHONDYLIUM. *Common Cow Parsnip.*

Nuttall says the two species here mentioned are scarcely distinct. The present article was brought into notice by the late Dr. Joseph Orne, of Salem. In a communication to the Massachusetts Medical Society, October, 1803, he thus describes it: Common Cow Parsnip. (*Sphondylium vulgare hirsutum. Park. C. B.*) It grows in hedges; the stalk is large and tubular, invested with a down which also covers the leaves, that are large and jagged, five on each stalk, and of the colour of wormwood; it is umbelliferous, and flowers in June; the root is divided into several long and fibrous branches, resembling a large parsley root; and the height of the plant, in its maturity, may be from two to four feet: the root has a rank strong smell, and a pungent and almost caustic taste; it should be carefully distinguished from the common parsnip, that grows wild in gardens, and hedges; and, indeed, it has a very different appearance.

The particular disease in which Dr. Orne commends the cow parsnip, is that of epilepsy. Three of the five cases which are exhibited in his communication, were cured by the use of this medicine. The author judiciously observes, that in the three successful cases, the patients were remarkably liable to flatulence, with symptoms of morbid sensibility of the stomach, and date their first relief from the sensation of a more firm and healthful tone of that organ, and the carminative effects of the medicine. He commonly prescribed two or three drachms of the pulverized root, to be taken every day for a great length of time, and a strong infusion of the leaves and tops to be drunk at bed-time.

In the hands of other practitioners, this plant has manifested considerable efficacy, exerting its peculiar powers immediately on the stomach, as an excellent carminative; and, if it does not cure epilepsy, it generally mitigates the distressing symptoms attending that disease. In some cases of dyspepsia, accompanied with flatulencies and cardialgia, a strong decoction of this plant has been given by Dr. Mann with satisfactory success.

HEUCHERA. *A.* HEUCHERA CORTUSA, VEL AMERICANA.
Alum Root. American Sanicle.

The root is an intense astringent; and is the basis of a powder which has lately acquired some reputation in the cure of cancer. It is one of the articles in the materia medica of our Indians. They apply the powdered root to wounds, and ulcers, and cancers.*

* Barton's Collections, Part I. and II.

HIRUDO MEDICINALIS. *D.* *The Leech.*

Only one species of leech is used in medicine. It has a flat and slimy body, composed of rings, tapering towards the head, which is turbinated, commonly about two or three inches long, and of the thickness of a goose-quill, but capable of elongating or contracting itself very much. Its back is of a dull olive-green colour, divided into three nearly equal parts by four yellow longitudinal lines, the two lateral entire, the two central broken with black. Besides these, between the lateral and central lines on each side, there are two others, resembling a chain of black and yellow. The belly is turkey blue, irregularly marked with yellow spots. It attaches itself to solid substances by either end, being furnished with a circular sucker at the anal extremity, and a horse-shoe one at the head, with a triangular mouth in the centre.

They should be collected in summer, in waters having a clear sandy bottom, as the bite of those found in stagnant waters and marshes is said to cause pain and inflammation. For the same reason, the horse leech, which is entirely brown, or only marked with a marginal yellow line, is commonly rejected, although they are used frequently in the north of Europe, and during the late scarcity of leeches have occasionally been employed, without any bad consequences, in England. The vulgar story of their drawing the whole blood out of the body, by evacuating it at one end as fast they sucked it in at the other, if true, would give them a superiority over the others, as when a sufficient quantity of blood was drawn, there could be no difficulty in making them quit, even without passing a ligature round their necks.

Leeches are best preserved for use in a bottle half filled with pure spring or river water, and covered with gauze or muslin, although they are said not to die even in an exhausted receiver, nor in a vessel filled with oil. It is advisable frequently to change the water in which they are kept, although there are instances of their being many months and even years in the same water; and it is remarkable, that water in which they are, keeps much longer sweet, than by itself. It is scarcely necessary to observe, that whenever the water becomes turbid or foul, or gets an unpleasant smell, or any of the leeches die in it, it should be changed. They should always be kept in a moderate temperature, about 50° Fahr. Some recommend throwing a little bran into the water; but it is so well ascertained that they will live for years without any such addition, that it is better not to attempt to feed them, until we are better acquainted with their natural food. Though apparently so hardy, leeches are sometimes subject to great mortality from unknown causes, as in 1798 and 1799. Infection, in some cases, seems evident. To avoid danger from this source, they should be kept rather in several small vessels, than in one large reservoir; and when fresh leeches are procured, they should always be kept by themselves, and their

health ascertained, before they are added to the general stock. When they have gorged themselves with blood, they frequently die of indigestion, and cause a great mortality even among those who have not been used. To avoid this danger, leeches which have recently sucked, should also be kept by themselves, until they have recovered their usual vigour. The treatment of the individuals which have performed their office, has been the subject of some controversy. One recommends using no means to make them disgorge the blood they have sucked, but only to immerse them for half an hour in milk-warm water, and to change their water regularly every second day for some time ; others advise stripping them, as it is called, that is, taking hold of the tail between the finger and thumb of the left hand, and drawing the animal through those of the right, so as to evacuate the blood ; while others, again, apply salt to their heads until they vomit all the blood they have sucked. Leeches change their skin frequently. At that time they are subject to indisposition, and will not bite. The removal of the old cuticle may sometimes be assisted by wiping them with a bit of soft linen.

Medical use.—Leeches are a very old and useful remedy in every case requiring local blood-letting. They cause less irritation than cupping, and can often be applied nearer to the part.

They are used,

1. In inflammation of all kinds, ophthalmia, phrenitis, cynanche, rheumatismus, odontalgia, podagra.
2. In some cases of rubeola and scarlatina.
3. In suppressed natural or habitual hæmorrhagies, especially piles.
4. In plethora of the head, chincough, in mania from suppressed discharges.
5. Dysuria phlogistica.
6. In the head-ach of the first or inflammatory stage of continual fever.

The application of leeches is sometimes attended with difficulty. When changing their skin they will not bite, and are averse to it in cloudy rainy weather, and in the evening. When kept out of the water some minutes before they are applied, and allowed to crawl on dry linen, they are said to bite more eagerly. The part to which they are to be applied should be very well washed, first with soap and water, and afterwards with water, or milk and water, and if covered with strong hairs, should be shaved. When they are not inclined to bite, the part may be moistened with milk, or a little blood drawn from it, by a scratch with a lancet. When they fix, they inflict, without causing much pain, a wound of three minute flaps, meeting at equal angles, from which they suck blood until they are gorged, and drop off spontaneously, or are forced to quit their hold by sprinkling on them a little salt. A large leech will draw about an ounce of blood ; but the quantity may be much increased by bathing the wounds with tepid water, or applying over

them cupping glasses. Sometimes it is more difficult to stop the bleeding; but it will always cease on applying a little lint, and continuing pressure a sufficient length of time.

HORDEUM. *A.* *Barley.*

Hordeum Distichon. *The decorticated Seeds. Pearl Barley.*

Barley is an annual plant, cultivated in almost every country of Europe. Linnæus says that it is a native of Tartary, but without adducing sufficient proof.

Pearl barley is prepared by grinding off the husks of rough barley, and forming the grain into little round granules, which appear of a kind of pearly whiteness. In this state barley consists almost solely of amylaceous matter, and when boiled forms an excellent article of nourishment; while a decoction of it, properly acidulated, is one of the best beverages in acute diseases.

Barley meal, according to Fourcroy and Vauquelin, contains a little unctuous coagulable oil, sugar, starch, an animal substance partly soluble in water, and partly in glutinous flocculi; phosphat of lime and magnesia, silica, iron, and a little acetic acid.

Common barley will answer every purpose to which this more expensive article is applied in medicine.

HUMULUS. *A.* Humulus Lupulus. *L.*

The Hop. The dried Stobiles.

The hop is an indigenous perennial climbing plant, cultivated to a great extent in Kent, and some other counties in England, for its leafy tops, which are used in the brewing of ale and porter; and as a very considerable revenue arises from the duty imposed on them, the use of all other bitters, such as quassia, &c. is prohibited by act of parliament; as, indeed, hops themselves once were. In the north of Europe, the young shoots are eaten instead of asparagus.

Hops are intensely bitter, aromatic, and astringent. By simple infusion the aroma is extracted; by short boiling the bitter, and by long continued boiling, the aroma is dissipated, and the astringency predominates. The aroma resides in a volatile oil, and the astringency in a species of tannin, for sulphat of iron is blackened by it. It also contains a resin from which it has its bitterness, and a nauseous mucilaginous extractive, which alcohol precipitates from the infusion. Crystals of nitrat and muriat of potash appear in a long

kept extract. The old writers say, that hops are added to malt liquors on account of the lithontriptic virtues which they were supposed to possess; thus Ray affirms, that since the Londoners added hops to their beer, they have been less subject to calculous complaints; and if we were to believe Lobb, a very hard urinary calculus was softened by a decoction of hops. Their evident effects are to impart an aromatic bitter, and to retard the acetous fermentation; for malt liquors keep longer in proportion to the quantity of hops added, and the bitterness decreases as the liquor becomes ripe, and disappears as it verges to acidity. Bergius supposes that the sweetness of the malt would hurt the stomach, were it not corrected by the bitterness of the hop. It also probably communicates a narcotic quality. A pillow stuffed with hops is said to have long been a popular remedy, and recent experiments have confirmed the fact, and led to the employment of various preparations of hops in medicine. The dose of the powder is about three grains, although it may be remarked that it is very difficult to powder. It produced sleep, in the experiments of Dr. De Roches, in rheumatic, syphilitic, and pectoral complaints. The tincture seemed to possess the same anodyne virtues, but it was not so uniform in its action. Dr. Maton gave it in the form of tincture and extract, with the best effects, in articular rheumatisms. He did not observe that it had any influence in relaxing the bowels, but the contrary; and he is disposed to believe that the pulse is reduced in frequency, and increased in firmness, by this medicine, in a very direct manner. An ointment compounded with the hop, is said, by Mr. Freake, to have eased the violent pain in the last stage of cancer, when all other applications were ineffectual.

The hop is indigenous in America. It occurs wild in the Atlantic States, and was found by Mr. Nuttall on the banks of the Missouri. An excellent and most interesting series of experiments have been lately published on this plant, by Dr. Ives of New-York, in which he has successfully shown, that the virtues of the hop reside in a semi-resinous substance, in the form of minute, yellow, transparent globules, appearing on the outside of the scales of the calyx and corolla, near their base.

According to Dr. Ives, it consists of tannin, extractive matter, a bitter principle, wax, resin, and a woody fibrous substance, besides the aromatic principle, which he could not separate in the form of volatile oil.

Dr. Ives' first views on the subject may be learned from the following extract of a letter to me, whilst prosecuting his researches. A much more ample detail is given in his communication in Professor Silliman's Journal, and in Professor Bigelow's Medical Botany.

"As you have been interested in the subject of Materia Medica, you may perhaps be gratified to know the result of my experiments on the hop. Lest I should be suspected of an intemperate enthusiasm, it is necessary to observe, that I have not been particularly, or rather, exclusively, devoted to the examination of this article. I have for

some months past been engaged in reviewing the proximate principles and medicinal virtues of the indigenous plants, and the hop among others.

"I think I have demonstrated, that the virtues of this article exist exclusively in the pollen. It is easy to procure an ounce of the pollen from a pound of merchantable hops, and to obtain from it about half an ounce of alcoholic extract. This will be composed of resin, a bitter principle, wax, tannin, and an extractive matter. I think the narcotic property resides in the resin. It is but sparingly, if at all yielded to water. The alcoholic infusion is aromatic and intensely bitter. I think it a useful and elegant medicine.

"I am not yet prepared to say, that the pollen can be all separated from the petals by threshing; but were I to conclude from the ease with which I have obtained it, and the inert extract obtained from hops from which the pollen has been completely separated, I should presume there was as little propriety in carrying hops to market in the chaff, as corn, beans, or wheat. I shall say no more at present on the subject, as I hope you will ultimately see the result of my labours in a more eligible form, and opinions are always to be distrusted which are formed during the ardour of novel investigations."

HYDRARGYRUM. *A. L. D. E.—MERCURY.*

Argentum Vivum. *Quicksilver.*

Mercury is very bright white; specific gravity 13.568; freezing at — 39; boiling at 660°, partly ductile and malleable; oxydizable by trituration in the air, and in a farther degree by the action of the air and heat; does not decompose water; forms amalgams with many metals; and is oxydized and dissolved by the sulphuric, nitric, and oxy-muriatic acids. Oxyds, black, red.

It is found,

I. In its metallic state:

a. Uncombined.
b. Alloyed with silver.
c. Alloyed with copper.
d. Combined with sulphur, (Cinnabar.)
e. Combined with hydrogureted sulphur, (Æthiops minerale.)

II. Oxydized:

a. Combined with muriatic acid.
b. ———————— sulphuric acid.

There are considerable mines of mercury in Hungary, Spain, and South America; and what is employed in England is principally imported from the former country.

Mercury taken into the stomach in its metallic state has no action on the body, except what arises from its weight or bulk. It is not poisonous as was vulgarly supposed, but perfectly inert.* But in its various states of combination, it produces decided sensible effects. It quickens the circulation, and increases all the secretions and excretions. According to circumstances, the habit of the body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various; it sometimes increases one secretion more particularly, sometimes another, but its most characteristic effect is the increased flow of saliva, which it generally excites, if given in sufficient quantity. Its particular effects, and means of producing each of them, will be noticed hereafter.

Mercury, or some of its preparations, is exhibited,

1. As an errhine. The sub-sulphat of mercury.
2. As a sialagogue. Mercury, in almost any form.
3. As a cathartic. The sub-muriat of mercury, (calomel).
4. As a diuretic. The oxyds, the muriat, and the sub-muriat, combined with other diuretics.
5. As a sudorific. Calomel, conjoined with a sudorific regimen.
6. As an emmenagogue.
7. As an astringent. Muriat of mercury.
8. As a stimulant. Muriat of mercury.
9. As an antispasmodic.
10. As an anthelmintic.

With some of these views mercury is frequently exhibited,

1. In febrile diseases; in obstinate agues.
2. In inflammatory diseases; in indolent and chronic inflammations, especially of the glandular viscera, as the liver, spleen, &c.
3. In exanthematous diseases; variola.
4. In profluvia; in dysentery.
5. In spasmodic diseases; tetanus, trismus, hydrophobia, &c.
6. In cachectic diseases; anasarca, ascites, hydrothorax, hydrocephalus, &c.
7. In impetigines; scrofula, syphilis, lepra, icterus, &c.
8. In local diseases; in caligo corneæ, amaurosis, gonorrhœa, obstipatio, amenorrhœa suppressionis, tumours of various kind, herpes, tinea, psora, &c.

Mercury occasionally attacks the bowels, and causes violent purging, even of blood. The effect is remedied by intermitting the use of the medicine, and by exhibiting opium.

At other times it is suddenly determined to the mouth, and produces inflammation, ulceration, and an excessive flow of saliva. In this case, too, the use of the mercury must be discontinued for a time; when, according to Mr. Pearson's advice, the patient should be freely exposed to a dry cold air, with the occasional use of ca-

* This is somewhat doubtful, from the observations of Orfila. See his Toxicology, Vol. I.

thartics, Peruvian bark, and mineral acids, and the assiduous application of astringent gargles. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or exposure to cold and moisture, while under the influence of mercury. The danger is to be obviated by the quick introduction of mercury, so as to affect the gums, with the occasional use of the warm bath.

Sometimes also a morbid condition of the system occurs during a mercurial course, and tends to a fatal issue. Mr. Pearson has termed it Erethismus. It is characterized by great depression of strength; a sense of anxiety about the præcordia; frequent sighing; trembling, partial or universal; a small quick pulse; sometimes vomiting; a pale contracted countenance, a sense of coldness, while the tongue is seldom furred, or the vital or natural functions much disordered. In this state, a sudden or violent exertion of muscular power will sometimes prove fatal. To prevent dangerous consequences, the mercury must be discontinued, whatever may be the stage, extent, or violence of the disease for which it has been exhibited, and the patient must expose himself freely to a dry and cool air, in such a manner as shall be attended with the least fatigue; and in the course of ten or fourteen days, he will sometimes be so far recovered, that he may safely resume the use of mercury.

In some particular habits it also produces an exanthematous disease, which sometimes proves fatal, well known by the name of erythema or eczema mercuriale and hydrargyria.

From many motives, both laudable and culpable, mercury has been tortured into a greater variety of forms than any other article of the materia medica. Of these Swediaur has given a complete table, in the last edition of his works on the venereal disease.

Mercury, in its metallic state, is never applied to any medical use, except in visceral obstruction, in hopes of forcing a passage by its gravity; but under various forms of preparation, it affords a series of very active remedies. Adulterations. With the exception of Peruvian bark, there is perhaps no active article in the materia medica more shamefully adulterated; its impurity is at once indicated by its dull aspect; by its tarnishing, and becoming covered with a grey film; by its diminished mobility, in consequence of which its globules are unable to retain the spherical form, and therefore *tail*, as it is technically expressed. *Lead* is discovered by dissolving it in nitric acid, and adding to the solution, water impregnated with sulphureted hydrogen, when, if lead be present, a dark brown precipitate will ensue. *Bismuth*, by pouring the nitric solution into distilled water, when it will appear as a white precipitate. *Zinc*, by exposing the mercury to heat. *Tin* is detected by a dilute solution of nitro-muriat of gold, which throws down a purple precipitate. The presence of lead in mercury is a most dangerous circumstance. The usual mode of purifying quicksilver, by pressing it through chamois leather, will not separate the lead, if it be, as is generally the case, in combination with bismuth; for the manner in which the adultera-

tion is effected, is by melting with a gentle heat these two metals, and adding the alloy to the mercury, and although this alloy should exceed one-fourth of the whole bulk, it will pass, together with the mercury, through chamois leather. On standing, the bismuth will be thrown upon the surface, in the form of a dark powder, but the lead will remain in solution.* On a superficial examination, it ought not, when shaken with water, to impart to it any colour; when agitated or digested with vinegar, it should not communicate a sweetish taste; and when exposed in an iron spoon to heat, it ought to evaporate entirely. The French are so well aware of the mischievous extent to which this metal is falsified, that in their late Codex they direct the reduction of the *red oxyd* in order to obtain it; the process however is far two expensive for general adoption. The Italian Jews purify quicksilver for their barometers, by digesting it in dilute sulphuric acid, which is by no means an improper process. The mode directed for the purification of mercury by the London College, (*Hydrargyrum Purificatum*) is unable to separate it *completely* from its more deleterious contaminations. It is a general opinion in Germany, that mercury boiled in water will impart to it an anthelmintic virtue; this, if it happens, can only depend upon the impurities of the mercury; but large draughts of cold water are in themselves anthelmintic.

HYDRARGYRUM PURIFICATUM. *A. E. L. D.*

Purified Mercury.

Take of
  Mercury, ... six pounds;
  Iron filings, ... one pound.
Rub them together and distil the mercury from an iron retort.

The quicksilver of commerce is often adulterated with lead, tin, or other metals, which renders it unfit for internal use, and for many preparations. It therefore becomes necessary to purify it, and fortunately its comparatively great volatility supplies us with an easy process. The Dublin College distil it simply without any addition; but, lest towards the end of the process the mercury should elevate any impurities along with it, they draw off but two thirds. The principal objection to this process is the want of economy; for although the remaining third may be used for some purposes, its value is very much depreciated. As iron has a much stronger affinity for almost all the substances with which quicksilver may be adulterated than quicksilver has, by adding iron-filings we may draw off the whole quicksilver by distillation, without any fear of the impurities rising along with it.

Glass-retorts are inadmissible in this distillation; because when

* So says Dr. Paris. Are the British Druggists perfectly unacquainted with the arts of adulteration of medicines? Compare their periodical journals on this point!! It might have been well to remember the old saying, "he whose house," &c.!

the mercury begins to boil, the concussion is so great, that they would certainly be broken. Iron-retorts are the best, although strong earthen ones may be also used. The receiver may be of the same materials, or of glass, if we wish to inspect the progress of the operation; but in this case we must interpose an adopter between the retort and receiver, and fill the receiver nearly full of water, that the mercury may not crack it by falling hot into it. The retort employed should be so large, that the quicksilver should not fill above one third of it. A bended gun-barrel will answer for small quantities.

Acetas Hydrargyri. *D. E.* *Acetat of Mercury.*

Take of
Purified quicksilver, . . . three ounces;
Diluted nitrous acid, . . . four ounces and a half, or a little more than may be required for dissolving the mercury;
Acetat of potass, ... three ounces;
Boiling water, ... eight pints.
Mix the quicksilver with the diluted nitrous acid; and after the effervescence has ceased, digest if necessary with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetat of potass in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystallize. Place the crystals in a funnel, and wash them with cool distilled water; and, lastly, dry them with as gentle a heat as possible. Glass vessels must be used throughout.

This process of the Edinburgh College was ascertained by very careful experiment, and if its directions be accurately followed, the preparation succeeds admirably. Nitrat of mercury is decomposed by acetat of potass; and the products are acetat of mercury and nitrat of potass. The nitrat of potass being much more soluble than the acetat of mercury, remains in solution after the latter is separated by cristallization. Mercury is capable of forming different combinations with nitrous acid, which possess each their characteristic properties. When we employ a sufficient quantity of acid to dissolve the mercury without the assistance of heat, and to retain it in solution, there is always an excess of acid; and therefore it is a solution of super-nitrat of mercury. If we evaporate this solution very gently, or if we employ a larger proportion of mercury at first, and assist the action of the acid by a gentle heat, we obtain nitrat of mercury crystallized in various forms. In these the mercury is in the state of protoxyd. But if we assist the action of the acid by boiling, the mercury is converted into peroxyd, and a larger quantity is dissolved. This solution is very apt to crystallize, both on cooling and by the diminution of the quantity of acid during the process; and if we attempt to dilute the solution with water, a copious precipitate of subnitrat of mercury immediately takes place, and the solution contains

super-nitrat of mercury. If the dilution be made with cold water, the sub-nitrat has a white colour, which, by a very slight application of heat, passes to a beautiful yellow, the colour which it has at first when separated by boiling water.

For making the acetat of mercury, the nitrat is prepared with a very gentle heat, and with excess of acid, that it may be retained in perfect solution, and that there may be no possibility of any admixture of sub-nitrat with the acetat formed. A larger proportion of acid is used by the Edinburgh College than by the other Colleges, but by careful experiment it was ascertained to be necessary for the success of the process. In mixing the solutions, we must be careful to pour the mercurial solution into that of the acetat of potass, because, by adopting the contrary procedure, the sub-nitrat of mercury will be precipitated undecomposed, if any peroxyd be contained in the mercurial solution. For dissolving the acetat of potass, the London College only use as much water as is capable of retaining the nitrat of potass in solution; the acetat of mercury is therefore precipitated, and is purified by again dissolving it in boiling water and crystallizing it. This part of the process is simplified by the Edinburgh and Dublin Colleges, who use as much water for dissolving the acetat of potass, as is capable of retaining, as long as it is hot, the acetat of mercury in solution, and of allowing it to crystallize as it cools. In this way, therefore, it is procured at once sufficiently pure. The exsiccation of the acetat of mercury is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed. It is best dried by compressing it between several folds of bibulous paper.

The Prussian Dispensatory directs acetat of mercury to be prepared by dissolving two ounces of the red oxyd of mercury in about seven ounces of concentrated acetic acid, and evaporating the solution to dryness; but this process affords a salt of a very different nature from that prepared according to the directions of the British Colleges, the latter containing protoxyd, and being crystallizable; and the former the peroxyd and not crystallizable.

Acetat of mercury is scarcely soluble in cold water, but dissolves readily in boiling water. It generally crystallizes in micaceous plates, and is extremely easy of decomposition.

It is supposed to be a mild preparation of mercury, and was the active ingredient of the celebrated Keyser's pills. In solution it has also been recommended externally, to remove freckles and cutaneous eruptions.

HYDRARGYRI OXYMURIAS. *A. L.*

MURIAS HYDRARGYRI CORROSIVUS. *E.*

MURIAS HYDRARGYRI CORROSIVUM. *D.*

Oxymuriat of Mercury, or Quicksilver.

Corrosive Muriat of Quicksilver. Corrosive Sublimate.

Synonimes.

MURIAS HYDRARGYRI. *Muriat of Mercury.*

PERMURIAS HYDRARGYRI. *Permuriat of Mercury.*

MERCURANA. *Deuto-chloruret of Mercury.*

Per-chloride of Mercury.

Take of
Purified mercury, ... two pounds;
Sulphuric acid, ... thirty ounces;
Dried muriat of soda, . . . four pounds.

Boil the mercury with the sulphuric acid in a glass vessel, until the sulphat of mercury is left dry. Rub this, when it is cold, with the dried muriat of soda in an earthen ware mortar; then sublime it in a glass cucurbit, increasing the heat gradually.

By boiling the quicksilver to dryness with sulphuric acid, the metal is oxydized by the decomposition of part of the acid, and combines with the rest to form sub-sulphat of quicksilver. In the second part of the process, this sub-sulphat is decomposed by dried muriat of soda; corrosive sublimate sublimes, and sulphat of soda remains behind. In Holland it is manufactured by subjecting to sublimation a mixture of dried sulphat of iron, nitrat of potass, muriat of soda, and quicksilver. In the former editions of the Edinburgh Pharmacopœia, the mercury was oxydized by boiling it to dryness in nitrous acid, and then sublimed with muriat of soda and sulphat of iron. Bergmann recommends the sublimation of sub-nitrat of mercury and muriat of soda, and Mr. Murray seems inclined to prefer it to the new process.

If a person should want this salt immediately, and be so situated as to be unable to procure it, it may be readily made by boiling muriatic acid over red precipitate, to dryness; dissolving the soluble part of the mass, and evaporating to crystallization.—It would probably be the readiest mode of formation even in the large way; for it requires no sublimation.

Medical use.—Muriat of mercury is one of the most violent poisons with which we are acquainted. Externally it acts as an escharotic or a caustic; and in solution it is used for destroying fungous flesh, and for removing herpetic eruptions; but even externally it must be used with very great caution. It has, however, been recommended to be given internally, by the respectable authorities of

Boerhaave and Van Swieten; and it is the active ingredient of all the empirical antivenereal syrups. Were it really capable of curing the venereal disease, or equal in efficacy to the common modes of administering mercury, it would possess many advantages over them in other respects: but that it cannot be depended upon, is almost demonstrated by its use as an antivenereal being very much confined to the quacks, and by the testimony of the most experienced practitioners. Mr. Pearson says, that it will sometimes cure the primary symptoms of syphilis, especially if it produce considerable soreness of the gums, and the common effects of mercury; but that it will often fail in removing a chancre; and where it has removed it, that the most steady perseverance will not secure the patient from a constitutional affection. It is on some occasions, however, a useful auxiliary to a mercurial course, in quickly bringing the system under the influence of mercury, and in supporting its action after the use of frictions, aud is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions. Corrosive sublimate in solution is often useful in croup, to excite screatus and vomiting, according to Dr. Barton. It is to be given for this purpose guttatim.

As this is a most important article of the Materia Medica, the following extract from Dr. Paris' Pharmacologia, will not be misplaced.

"*Qualities.—Form,* a crystalline mass, which is easily pulverized, and undergoes a slight alteration by exposure to air, becoming on its surface opaque and pulverulent. *Odour,* none. *Taste* very acrid, with a metallic astringency.

"*Chemical Composition.*—According to the latest views, it is a *Bichloride* of mercury, consisting of one proportional of mercury, to two proportionals of chlorine. In the French codex, it is termed "*Deuto-Chloruretum Hydrargyri.*"

"*Solubility.*—It is soluble in eleven parts of cold, and in three of boiling water, and in four parts of alcohol; it is also very soluble in ether; indeed, this latter liquid has the curious property of abstracting it from its solution in water, when agitated with it. Its solution in water is greatly expedited by the addition of a few drops of rectified spirit, or of muriatic acid. In a solution of muriat of ammonia it is thirty times more soluble than in water, no decomposition however arises; it is, therefore, probable, that a triple salt is formed; it is also soluble in the sulphuric, nitric, and muriatic acids, and may be obtained again unaltered, by simply evaporating the solutions. Its watery solution is said to change to green vegetable blues, but this is an optical fallacy.

"*Incompatible Substances.*—The *carbonats of the fixed* alkalies precipitate it of a yellow hue, but the precipitates are not pure oxyds; *ammonia* forms with it a white triple compound. *Lime water* decomposes it more perfectly than any alkaline body, occasioning a precipitate of a deep yellow colour,* which is a peroxyd of mercury

* "If the quantity of lime water be small, the precipitate will assume a red colour, and will be found to be a sub-muriat of the peroxyd.

containing a little muriatic acid; this result forms a useful lotion to ill-conditioned ulcers, and has been long known under the title of *aqua phagedenica;* one fluid ounce of lime water should be employed for the decomposition of two grains of the salt. *Tartarized antimony, nitrat of silver, acetat of lead, sulphur, sulphuret of potass,* and *soaps,* decompose it. *Iron, lead, copper, bismuth,* and *zinc,* in their metallic state, also decompose it, producing precipitates which consist of an amalgam of the metal employed, with calomel; hence mortars of glass or earthenware should be used for dispensing this article; when triturated with olive oil, the oil becomes white, and when boiled with it, *calomel* is precipitated; the same happens if sugar be substituted for the oil; the volatile oils reduce it. The following vegetable infusions produce precipitates, viz. *the infusions and decoctions of chamomile, horse-radish root, columba root, catechu, cinchona, rhubarb, senna, simarouba, oak-bark, tea* and *almond emulsion.* Swediaur observes, that "many authors have recommended *sublimate* combined with bark, but that a reciprocal decomposition is thus produced, by which the energies of both remedies are alike annulled;" to this ignorance, however, he thinks that many patients have been indebted for their lives; for, says he, "I see every day examples of weak and very delicate persons of both sexes, to whom ignorant practitioners prescribe, and sometimes in very large doses, the *corrosive sublimate,* with a decoction of bark, certainly without curing the syphilis, but at the same time without occasioning those grave and dangerous symptoms, which that acrid medicine would certainly produce, if given alone, or without that decoction."

"It is one of the most acrid and active of all metallic preparations; in well directed doses, however, it is frequently of service in secondary syphilis, and in cases of anomalous disease, when it would be improper to administer the other forms of mercury;* its

* "As this salt has been supposed to arrest the progress of syphilis more rapidly, and, at the same time, to excite the salivary glands less than any other preparation of mercury, it generally forms the basis of those dangerous nostrums, which are advertised for the *cure of syphilis, without mercury.* The contrivers hope also to elude detection by the density and colour of the preparation.

"*Gowland's Lotion.*—Is a solution of sublimate in an emulsion formed of bitter almonds, in the proportion of about gr. jss to one fluid ounce. A solution of this mercurial salt in spirit of rosemary, is also sold as an empirical cosmetic.

"*Norton's Drops.*—A disguised solution of corrosive sublimate.

"*Ward's White Drops.*—This once esteemed anti-scorbutic was prepared by dissolving mercury in nitric acid, and adding a solution of carbonat of ammonia, or frequently they consisted of a solution of sublimate with carbonat of ammonia.

"*Spilsbury's Antiscorbutic Drops.*—Of corrosive sublimate two drachms; prepared sulphuret of antimony one drachm; gentian root and orange peel, equal parts, two drachms; shavings of red sanders, one drachm, made with a pint of proof spirit into a tincture, which is to be digested and strained.

"*The Antivenereal Drops,*" so famous at Amsterdam, were analysed by Scheele, who found that they were composed of muriat of iron, with a small proportion of corrosive sublimate.

"*Marsden's Antiscorbutic Drops.*—A solution of sublimate in an infusion of gentian.

"*Green's Drops.*—The basis of these also is sublimate.

"*Solomon's Anti-Impetigines.*—A solution of sublimate.

"*Rob Anti-syphilitique, par M. Laffecteur, Medicin Chemiste.*—This popular nostrum of the French contains, as a principal ingredient, corrosive sublimate. A strong

exhibition should be accompanied with mucilaginous drinks; when an overdose has been taken, the *white* of egg, diluted with water, is the best antidote, for Orfila has found that albumen decomposes it, reducing it to the state of mild muriat, whilst the compound which it forms with it is inert. More recently, vegetable gluten, as existing in wheat-flour, is said to answer as well as albumen; for the administration of which all that is required is to give wheat flour and water.

" *Dose.*—One-eighth to half a grain.

" *Caution.*—The salt, as it is partially decomposed by light, should be kept in opaque bottles.

" *Adulterations.*—It ought to be volatilized by heat; it is frequently met with in commerce, contaminated with muriat of iron, sometimes with arsenic; the presence of calomel is at once discovered from its insolubility.

" *Tests of its presence.*—If any powder be suspected to contain this salt, expose it to heat in a coated tube, as directed in the treatment of arsenic, but without any carbonaceous admixture, when corrosive sublimate, if present, will rise and line the interior surface with a shining white crust. This crust is then to be dissolved in distilled water, and assayed by the following tests; 1st, *lime water* will produce, if the suspected solution contains this salt, a precipitate of an orange yellow colour. 2d, a single drop of a dilute solution of *sub-carbonat of potass* will at first produce a white precipitate, but on a still farther addition of the test, an orange coloured sediment will be formed. 3d, *sulphureted water* will throw down a dark coloured precipitate, which when dried and strongly heated may be volatilized without any alliaceous odour. A very ingenious application of galvanic electricity has been also proposed by Mr. Silvester, for the detection of *corrosive sublimate*, which will exhibit the mercury in a metallic state. A piece of zinc or iron wire about three inches in length, is to be twice bent at right angles, so as to

decoction of the arundo phragmitis, (the bullrush) is made, with the addition of sarsaparilla and aniseeds towards the end, which is evaporated and made into a rob, or syrup, to which the sublimate is added.

" *Sirop de Cuisiniere.*—This consists of decoctions of sarsaparilla, burrage flowers, white roses, senna, and aniseed, to which sublimate is added, and the whole is then made into a syrup with sugar and honey.

" *Terre Feuilletée Mercurielle of Pressavin.*—This is tartarized mercury, for it is made by boiling the oxyd of mercury (obtained by precipitating it from a nitric solution, by potass) with cream of tartar.

" *Velno's Vegetable Syrup.*—There is great obscurity with respect to the genuine composition of this nostrum; it is supposed to consist of sublimate rubbed up with honey and mucilage. I have reason, however, to believe that it contains antimony, and the syrup of marsh mallows. Swediaur says, that volatile alkali enters into it as an ingredient; this alkali was proposed by Dr. Peyrile, as a substitute for mercury, and it constitutes the active ingredient of the following composition, which was proposed by Mr. Besnard, physician to the king of Bavaria.

" *Tinctura Antisyphilitica.*—Sub-carb. potass, one pound, dissolved in aq. cinnam. one pint; opii puri, two ounces, dissolved in spir. cinnamom. four fluid ounces; mix these separate solutions, and put them on a water bath for three weeks, taking care to shake the vessel frequently; to this add gum arabic, two ounces; carb. ammoniæ, one ounce, dissolve in aq. cinnamomi; mix, filter, and keep for use. Dose, twenty-four drops three times a day, in a glass of the cold decoction of marsh mallow root.

" The external use of these drops is also advised for local syphilitic complaints!"

resemble the Greek letter Π, the two legs of this figure should be distant about the diameter of a common gold wedding ring from each other, and the two ends of the bent wire must afterwards be tied to a ring of this description. Let a plate of glass, not less than three inches square, be laid as nearly horizontal as possible, and on one side drop some sulphuric acid, diluted with about six times its weight of water, till it spreads to the size of a half-penny. At a little distance from this, towards the other side, next drop some of the solution supposed to contain corrosive sublimate, till the edges of the two liquids join together; and let the wire and ring, prepared as above, be laid in such a way that the wire may touch the acid, while the gold ring is in contact with the suspected liquid. If the minutest quantity of corrosive sublimate be present, the ring in a few minutes will be covered with mercury on the part which touched the fluid.

Brugnatelli* has proposed the following method of detecting *corrosive sublimate* and *arsenic*:—Take a quantity of fresh wheat starch, mix with water, and add a sufficient quantity of *iodine* to give the liquid a blue colour; if *corrosive sublimate*, or *arsenic*, be added to this liquor, the colour is alike destroyed, and it becomes reddish, but if the change has been effected by the latter substance, a few drops of sulphuric acid will restore the blue colour, but if by the former it is not recoverable by such means.

LIQUOR HYDRARGYRI OXYMURIATIS. *A. L.*

Solution of Oxymuriat of Mercury.

Take of
- Oxymuriat of quicksilver, . . . eight grains;
- Distilled water, ... fifteen fluid ounces;
- Rectified spirit, ... one fluid ounce.

Dissolve the oxymuriat of quicksilver in the water, and add to it the spirit.

This solution contains in each fluid ounce, half a grain of the oxymuriat of quicksilver. The spirit is added to preserve the solution from spoiling.

The addition of the alcohol is absolutely useless, at least with the intention for which it is said to be added. The corrosive sublimate is, of all other articles, the best preventive against this result, and a simple aqueous solution would remain free of change until completely evaporated.

* Ann. de Chimie et Phys. iv. 334.

HYDRARGYRI SUBMURIAS. *A. L.* *Sub-muriat of Mercury.*

SUBMURIAS HYDRARGYRI MITIS. *E.* *Mild Sub-muriat of Mercury.*

SUBMURIAS HYDRARGYRI SUBLIMATUM. *D.*
Sublimed Sub-muriat of Mercury.

CALOMELAS. *Calomel.*

Proto Chloruret (Chloride) of Mercury. Muriat of Mercury.
Muriat of Black Oxyd of Mercury.
Mercurane. Draco Mitigatus. Aquila Alba. Aquila Mitigata.
Manna Metallorum. Panchymagogum Minerale, vel Quercetanum.
Sublimatum Dulce. &c. &c.

Amidst all these varieties of names, there is not one, as Dr. Paris has properly observed, so objectionable as that selected by the London College, and adopted by our National Pharmacopœia.

It certainly would have been better to have selected a name which had no connexion with any of the doctrines of muriatic acid or chlorine, inasmuch as, if they are found incorrect, a corresponding change of name again becomes essential; but the present name is not appropriate on either theory; if a muriat at all, it is a *perfect* muriat of the *black oxyd* of mercury; corrosive sublimate being equally a *perfect* muriat of the *red oxyd;* the only difference between the two, therefore, being dependant on the degree of oxydizement of the mercury, which is at a minimum (*protoxyd*) in the calomel, and at a maximum (*peroxyd*) in sublimate; and on the relative quantities of muriatic acid, which these oxyds are respectively able to saturate.

According to the new views of chlorine, calomel consists of *one proportion* of chlorine in union with *one proportion* of the *metal,* forming a chloride or proto-chloride of mercury; whilst corrosive sublimate consists of *one proportion* of the metal, and *two proportions* of chlorine; it is, therefore, likewise a chloride, or bi-chloride of mercury. Under these difficulties of selecting names founded on true chemical principles, and at the same time sufficiently distinct from each other, to prevent the possibility of mistaking calomel and corrosive sublimate for each other; it is submitted with confidence, that none superior to those just mentioned, (*calomel,* and *corrosive sublimate*) can be pointed out. They are concise, unconnected with any theory of past, present, or future times, and the dangerous one is additionally guarded by a corresponding epithet. The pride of science ought unquestionably to yield to utility on such an occasion; and it is to be hoped, that ere long, the medical men of every country will be satisfied to reject all the numerous synonimes of the two salts in question, and employ solely those above mentioned.

To return from this digression, to the preparation itself.

Take of
Corrosive sublimate, ... one pound;
Purified mercury, ... nine ounces.

Rub them together in a glass or Wedgwood mortar till the metallic globules disappear; then sublime; take out the sublimed mass, and reduce it to powder, and sublime it in the same manner twice more successively. Lastly, bring it into the state of a very fine powder, by the same process which has been directed for the preparation of carbonat of lime.

When quicksilver is triturated with muriat of quicksilver, it abstracts from the oxydized quicksilver of the muriat a part of its oxygen, and the whole mass assumes a blackish grey colour. When this is exposed to a degree of heat sufficient to convert it into vapour, the action of the different portions of quicksilver upon each other, and upon the muriatic acid, is much more complete: and the whole is converted into a solid white mass, consisting of mercury, in a state of less oxydizement, and combined with less acid than in the muriat, or of about twice the quantity of mercury, with the same quantity of oxygen and acid. According to Sir H. Davy's theory, in the first part of the process, the additional mercury is merely mechanically divided, and by the sublimation twice the quantity of mercury is combined with the same quantity of chlorine.

The trituration of the muriat of mercury is a very noxious operation, as it is almost impossible to prevent the finer particles from rising and affecting the operator's eyes and nostrils. To lessen this evil, the Edinburgh College direct the addition of a little water. In the second part of the process, when the heat is applied, a small portion of quicksilver and undecomposed muriat first arise, and condense themselves in the highest part or neck of the phial; then the sub muriat rises, and being less volatile, condenses in the upper half of the body, while a small quantity of quicksilver, in a state of considerable oxydizement, remains fixed, or near the bottom. The Edinburgh College separates the sub-muriat from the other matters, and sublimes it again. The London and Dublin Colleges triturate the whole together again, and re-sublime it twice. As in the first sublimation, a portion of the quicksilver and of the muriat of quicksilver always rise undecomposed, a second sublimation is necessary, especially if we triturate the whole products of the first sublimation together: but any farther repetition of the process is perfectly useless. Lest any portion of muriat should have escaped decomposition, the sub-muriat must be edulcorated with boiling distilled water, until the water which comes off forms no precipitate with alkalies.

Sub-muriat of mercury is generally obtained in the form of a white solid mass, but is capable of crystallizing in tetrahedral prisms terminated by pyramids. It has no taste, and is scarcely soluble in water or in alcohol. It is less volatile than muriat of mercury. It is blackened by light, and becomes brown or black when triturated with lime-water or the alkalies. It is converted by oxymuriatic acid into muriat of quicksilver. According to Mr. Chenevix, it consists of 79 quicksilver, with 9.5 oxygen, and 1.15 muriatic acid; and ac-

cording to Mr. Zaboada, of 85 quicksilver, with 4.4 oxygen, and 10.6 muriatic acid.

From Mr. Chenevix's analysis, we should conclude that 54 parts of quicksilver were sufficient to convert 100 of the muriat into sub-muriat; but, according to Zaboada's, 75 are necessary, which is exactly the proportion directed by the Colleges, and is also more conformable to Sir H. Davy's view of their composition; for he considers the muriat, *mercurana*, as consisting of one proportion of mercury 380, and two of chlorine 134, and the sub-muriat, *mercurane*, of one of mercury 380, and one of chlorine 67; which gives us 73.9 as the quantity of mercury necessary to convert 100 of muriat into sub-muriat.

Medical use.—The sub-muriat of quicksilver is one of the best mercurials we possess. By proper management it may be made to increase, in a remarkable manner, almost any of the secretions or excretions. One grain mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye, to remove specks from the cornea. Given in doses of one grain morning and evening, or in larger doses combined with opium, to prevent it from acting as a purgative, it excites ptyalism. In larger doses of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with sudorifics, sudorific.

It is one of the preparations of mercury which is capable of curing syphilis in every form. It also produces very powerful and salutary effects in obstructions and chronic inflammations of the viscera, especially of the liver; and, in general, it is applicable to every case in which mercurials are indicated.

Corrosive sublimate may be detected, if present, in calomel, by precipitation being produced by the carbonat of potash, in a solution made by boiling the suspended sample with a small portion of muriat of ammonia in distilled water. Calomel ought also, when rubbed with *pure* ammonia, to become intensely black, and not to exhibit any trace of an orange hue.

Incompatible substances.—Alkalies and lime-water decompose it and turn it black, in consequence of abstracting the acid, and leaving free the black oxyd. It is also decomposed by *soaps, sulphurets of potash* and *antimony;* and by *iron, lead* and *copper;* hence metallic mortars should be avoided in its preparations. If calomel be boiled for a few minutes in distilled water with alcoholized potash, it is completely decomposed, a muriat of potash, and black oxyd of mercury being the results.*

* Calomel is thus made in India under the name of *Rascapur.*

Take of
Mercury,
Bole armoniac,
Alum, (or blue vitriol,)
Rock salt, of each, nine parts.

Rub them together in a mortar with water, and let the mass harden. Put it into a glazed earthen vessel, and invert another over it, luting them together; keep them three days and three nights in a fire of cowdung.—*Asiatic Researches*, 11. 191.

Submurias Hydrargyri Præcipitatus. *E. D.*

Precipitated Sub-muriat of Quicksilver. Precipitated Calomel.

Take of
Diluted nitrous acid,
Purified quicksilver, . . . each, eight ounces;
Muriat of soda, ... four ounces and a half;
Boiling water, ... eight pounds.

Mix the quicksilver with the diluted nitrous acid, and towards the end of the effervescence digest with a gentle heat, frequently shaking the vessel in the mean time. But it is necessary to add more quicksilver to the acid than it is capable of dissolving, that a perfectly saturated solution may be obtained.

Dissolve at the same time the muriat of soda in the boiling water, and into this solution pour the other while still hot, and mix them quickly by agitation; pour off the saline liquor after the precipitate has subsided, and wash the sub-muriat of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the sub-muriat until the water come off tasteless. *E.*

This prescription differs but little from that originally laid down by its inventor Scheele; and if due attention is paid to the directions given, I believe, from comparative trials, that no difference will be discovered between this and the common process. It is infinitely superior on account of its simplicity.

In the first part of this process, a perfectly saturated solution of nitrat of quicksilver is formed. In the second, there is a mutual decomposition of this nitrat, and of the muriat of soda; nitrat of soda is formed, and muriat of quicksilver with excess of oxyd: or, according to Sir H. Davy, the chlorine of the sodane combines with the mercury of the nitrat, forming mercurane, while the hydrogen of the muriatic acid and the oxygen of the mercurial oxyd combine to form water, nitric acid, and soda. In this preparation, our object is to obtain the insoluble compound which results from the combination of the protoxyd of mercury with muriatic acid. In this view, the application of heat, in dissolving the mercury in the nitrous acid, is improper; for a portion at least of the mercury is converted into its peroxyd, which occasions, in the first place, the formation of a little sub-nitrat of mercury, when poured into the saline solution; and, secondly, the formation of a proportion of muriat of mercury (corrosive sublimate), which must be washed away. Accordingly, Mr. Murray has found, that more of mild, and less corrosive muriat of mercury are formed, when the solution is made slowly and in the cold, than when the directions of the Colleges are complied with.

In Sir H. Davy's view of the subject, according to which calomel and corrosive sublimate are compounds of metallic mercury, with different proportions of chlorine, the object in this preparation is to get the largest quantity of mercury dissolved in the nitrous acid, so

that in decomposing muriat of soda, the smallest quantity of chlorine may be set at liberty; and as the peroxyd contains twice as much oxygen as the protoxyd, and acids seem to combine with a certain quantity of oxygen in oxyds, whatever be the quantity of metal united with them, the nitrat of the protoxyd of mercury will contain twice as much mercury as the nitrat of the peroxyd, and will of course give a double proportion of mercury to the chlorine set at liberty by the acid and oxygen.

When properly prepared, the sub-muriat obtained by precipitation scarcely differs from that obtained by sublimation. Göttling found no other difference than that the precipitated sub-muriat became grey, when triturated with lime-water, whereas the sublimed sub-muriat becomes black. But he exposed to heat half an ounce of the precipitated sub-muriat in a subliming apparatus; scarcely a grain of a reddish matter remained fixed; and the sublimed matter now became black when triturated with lime-water, and differed in no respect from sub-muriat prepared in the ordinary way by sublimation. It therefore would seem to be an improvement in the process, to sublime the sub-muriat after it is precipitated; especially as by that operation it would be most effectually separated from any sub-nitrat which might be mixed with it.

There is still another way of preparing the sub-muriat of mercury, without using corrosive sublimate, which must be noticed. It was contrived by Hermbstaedt, and is recommended by Moench with the confidence derived from experience, as the very best process for preparing the sub-muriat of quicksilver.

Take of

Pure quicksilver, ... seven ounces and a half;
Sulphuric acid, ... four ounces;
Dried muriat of soda, ... five ounces and a half.

Distil in a glass retort the sulphuric acid, with four ounces of the quicksilver, until they be converted into a dry white mass. Triturate the sulphat of mercury thus formed, with the remaining three ounces and a half of quicksilver, until the globules disappear; then add the muriat of soda; mix them and sublime. As the product of the first sublimation still contains un-oxydized quicksilver, it is to be again triturated and sublimed. The sublimate being washed, is now pure sub-muriat of quicksilver, and weighs about six ounces.

The theory of this process is the same with that of the formation of the muriat of quicksilver. The difference between the two products arises from the proportion of quicksilver being greater, and that of the muriat of soda employed being less. We are not prepared to state the comparative economy of the processes described, for preparing sub-muriat of quicksilver; but of the last process, we may observe, that, according to Mr. Chenevix's analysis, seven ounces and a half of quicksilver should furnish nine ounces and a half of sub-muriat of quicksilver; and according to M. Zaboada's

nearly nine; so that there is evidently a considerable loss, which must be owing either to the formation of muriat of quicksilver, or of oxyd of quicksilver.

HYDRARGYRI SUBMURIAS AMMONIATUS. *A.*

Hydrargyrum Præcipitatum Album. *L.*

Ammoniated Submuriat of Mercury. White Precipitated Quicksilver.

Take of
- Oxymuriat of quicksilver, ... half a pound;
- Muriat of ammonia, ... four ounces;
- Solution of sub-carbonat of potass, . . . half a pint;
- Distilled water, ... four pints.

Dissolve first the muriat of ammonia, and afterwards the oxymuriat of quicksilver, in the distilled water, and add to these the solution of sub-carbonat of potass. Wash the precipitate until it become insipid, and then dry it.

The Dublin College employs the following formula, which is certainly to be preferred, if the calomel is made by the process of precipitation.

Submurias Hydrargyri Ammoniatum. *D.*

Ammoniated Submuriat of Quicksilver.

Add to the liquor decanted from the precipitated sub-muriat of quicksilver, as much water of caustic ammonia as is sufficient to precipitate the whole metallic salt. Wash the precipitate with cold distilled water, and dry it on blotting paper.

Muriat of quicksilver is about thirty times more soluble in a solution of muriat of ammonia than in pure water; and, during the solution, there takes place a considerable increase of temperature. Now, as these facts sufficiently prove a reciprocal action of the two salts, and as there is no decomposition, it is evident that they must have combined to form a triple salt; especially as they cannot be again separated either by sublimation or crystallization. This compound may, therefore, with propriety, be termed muriat of mercury and ammonia. It is the sal alembroth of the alchemists. It is very soluble in water, and is sublimed by heat without decomposition. When to a solution of this salt we add a solution of an alkaline carbonat, either of potass, as directed by the London College, or of soda, as by that of Berlin, there occurs a partial decomposition. The alkali combines with a portion of the muriatic acid, and reduces the muriat of mercury and ammonia to the state of a sub-muriat, which being insoluble, falls to the bottom of the solution. The proportion of muriat of ammonia has been reduced in edition 1815 to one-half, probably in consequence of a remark of Mr. Phillips.

The process of the Dublin college is new and well contrived, as it converts to use the washings of the precipitated sub-muriat, and thus partly obviates the objection of want of economy in the directions given by the college for preparing it. By the simple addition of ammonia, the whole muriat of mercury contained in the washings is precipitated, in the form of sub-muriat of mercury and ammonia.

The sub-muriat of mercury and ammonia thus precipitated, has at first an earthy, and afterwards a metallic taste. It is not soluble in water. It is decomposed by heat, furnishing water, ammonia, and nitrogen gas, while 0.86 of sub-muriat of mercury remain behind. Sulphuric and nitric acids partially decompose it, and convert it into muriat of mercury, and triple salts of mercury and ammonia. Muriatic acid dissolves it, and converts it into muriat of quicksilver and ammonia. According to Fourcroy's analysis, it consists of

81	oxyd of mercury,
16	muriatic acid,
3	ammonia.
100	

It is only used for ointments; and its principal recommendation is its white colour.

It may seem extraordinary that a combination of this salt and of corrosive sublimate, should prove more efficacious in some cutaneous diseases, than either separately. Mr. Ring, surgeon in London, I believe, first recommended this conjunction; and I have in very many instances derived benefit from it, when no advantage was experienced from the separate ingredients. The following formula is that he recommends, and which I have made use of, occasionally varying the proportions.

Take of
White precipitate, . . . one scruple;
Corrosive sublimate, . . ten grains;
Hog's lard, ... one ounce.
Mix them thoroughly.

I think it might well take the place of the ointment of white precipitate, as a standard.

HYDRARGYRI OXYDUM CINEREUM. *A.*

PULVIS HYDRARGYRI CINEREUS. *D.*

Ash-coloured Oxyd (Powder) of Quicksilver.

Grey Oxyd of Mercury.

Take of
Submuriat of mercury, . . . one ounce;
Lime water, ... one gallon.
Boil the sub-muriat of mercury in the lime water, constantly stirring

until a grey oxyd is precipitated. Wash this with distilled water, and then dry it.

The National Pharmacopœia has, it seems, brought to light a *grey* oxyd of mercury! Heretofore it has been admitted by all chemists, that only two, viz: a *black* and a *red*, existed. Certainly this name is not founded on the present basis of chemical science; and as it is not superior to the old names, it would be best to reject it, as founded in error.

It requires some animadversion likewise, that the direction of the Pharmacopœia differs from its model in speaking of the grey oxyd *precipitating*. The London College says *more correctly*, "until the grey oxyd subsides," for certainly there is no precipitate in the present prescription.

This process is intended to furnish a substitute for the black oxyd of quicksilver, on which the efficacy of the mercurials most frequently employed, and most certainly useful, depends. In these, the mercury is oxydized by trituration, in contact with the atmosphere; but this operation is both so tedious and troublesome, that it is often imperfectly performed, or assisted by improper means.

When properly prepared, it is the protoxyd of mercury, but as frequently found in the shops, it contains a mixture of the triple salt, consisting of oxyd, ammonia and nitric acid. In using calomel for its preparation, as above, the precipitated calomel in its edulcorated state, but not dried, should be preferred.

This oxyd is said, however, by M. Braamcamp and Sigueira-Oliva, to be prepared in the greatest purity, by boiling the ash-coloured oxyd of the Edinburgh College, long and violently in water, until the triple salt be dissolved or decomposed. The proportion of oxygen, which protoxyd of mercury contains, has been very differently estimated by different chemists. Mr. Chenevix makes 100 parts of mercury unite with no less than twelve of oxygen; the Portuguese chemists with 8.1; M. Fourcroy with 4.16; M. Sefstrom and Sir H. Davy with 3.95; which last, besides the remarkable coincidence, is the most probable from other reasons.

The Prussian College directs a black oxyd of mercury to be prepared, by mixing four ounces of mercury with six ounces of nitrous acid, diluted with two ounces of distilled water, and occasionally agitating them, without heat, until the acid be saturated. The solution is then to be diluted with distilled water, and water of caustic ammonia to be dropt into it, as long as the precipitate formed is black.

HYDRARGYRI NITRICO-OXYDUM. *A. L.*

Nitric Oxyd of Mercury.

OXYDUM HYDRARGYRI RUBRUM PER ACIDUM NITRICUM. *E.*

Olim, MERCURIUS PRÆCIPITATUS RUBER.

OXYDUM HYDRARGYRI NITRICUM. *D.*

Red Oxyd of Quicksilver by Nitric Acid.

Nitric Oxyd of Quicksilver. Red Precipitate.

Take of
Purified mercury, . . . three pounds;
Nitric acid, ... one pound and a half;
Distilled water, ... two pints.

Mix in a glass vessel. Boil the mixture until the mercury is dissolved, and evaporate the solution with a gentle heat, to a dry white mass; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital, and placed the vessel in a sand bath, apply a gradually increased heat, until the matter be converted into very red scales.

In the first part of this process a fully saturated nitrat of mercury is formed. In the second part, the metal is oxydized to the maximum by the decomposition of the acid. When a sufficient heat is applied, the nitrat of mercury first melts, then exhales nitric oxyd gas, and changes its colour successively to yellow, orange, and brilliant purple red. If well prepared, it should have a crystalline scaly appearance; and it is entirely volatile at a red heat, and soluble without any residuum in nitrous acid. According to Fourcroy, it contains no nitrous acid, unless a sufficient heat has not been applied; but according to most other chemists it contains some nitrous acid; and differs from the red oxyd prepared by the action of heat alone, in always being more acrid.

This is an extremely difficult operation, and skilful operators not unfrequently fail to obtain it of that brilliant crystalline appearance which is esteemed. M. Paysse, who paid great attention to this preparation in Holland, where it is manufactured in large quantities, gives the following directions:—Dissolve 100 pounds of pure mercury in 140 of pure nitrous acid, of specific gravity 1.3 to 1.37, promoting their action by a sand-bath; evaporate by distillation, and, when the formation of nitrous gas indicates the decomposition of the nitrat of mercury, remove the receiver, and apply a steady and moderate heat for about eight hours, until a match, which has been just blown out, inflames, on being introduced into the matrass, which is a proof that the operation is finished. To its success it is necessary, 1. That the nitrous acid be not mixed with muriatic; 2. That it be sufficiently strong; 3. That the evaporation be conducted with a moderate heat; 4. That the vessel be sufficiently large and flat,

so that a large surface be exposed, and the whole equally heated; 5. That the heat be gradually augmented; and, lastly, That it be steadily maintained the whole time. Turf is the fittest fuel.

Medical use.—It is only used as an escharotic, and care must be taken that it is finely levigated, otherwise it only irritates, without destroying the parts to which it is applied. It is a very common application in chancres.

Hydrargyri Oxydum Rubrum. *L.* Oxydum Hydrargyri. *D.*

(Red) Oxyd of Quicksilver. Precipitate per se.

Take of

Purified quicksilver, any quantity.

Put it into an open glass vessel, with a narrow mouth and wide bottom. Expose this to about the six-hundredth degree of heat, until the metal be converted into red scales. *D.*

This is an extremely tedious, and therefore expensive operation, because mercury is incapable of absorbing from the atmosphere the quantity of oxygen necessary to convert it into the red oxyd, except when in the state of vapour. But as the form of a vessel, which will prevent the dissipation and loss of the mercurial vapour, will at the same time hinder the free access and frequent renewal of the air, the operation can only proceed slowly. The vessel most advantageously employed, is a wide, flat bottomed matrass, with a very narrow, almost capillary neck. Only so much mercury is introduced into it as will cover the bottom of the matrass; and the vessel is not inserted in the sand deeper than the mercury stands within it. A degree of heat is then applied sufficient to cause a gentle ebullition in the mercury, which is thus alternately converted into vapour, and condensed again in the upper part of the vessel. While in the state of vapour, it absorbs the oxygen of the air contained in the vessel: by which means it is gradually changed into a black, and then into a red, powder; but a complete conversion into the latter state is not effected in less than several months.

Red oxyd of quicksilver, thus prepared, consists of small crystalline grains, of a deep red colour, and very brilliant sparkling appearance. By heat, it may be sublimed in the form of a beautiful ruby-coloured vitrified substance. At a red heat it is decomposed, giving out oxygen gas, while the metal is revived, and is immediately volatilized. It is soluble in several of the acids; and during its solution, it does not decompose them or water. It is easily disoxydized. It consists, according to Chenevix, of 100 of mercury and 17.65 oxygen; Zaboada, 11.11; Fourcroy, 8.69; and M. Sefstrom and Sir H. Davy, 7.9; which last is the most probable estimate.

Medical use.—It is not only an acrid substance, violently purgative and emetic, but even caustic and poisonous. Its internal use is

proscribed; but it is applied externally as an escharotic, being previously triturated to a very fine powder; or it is formed into a stimulating ointment with unctuous substances.

Hydrargyrus cum Creta. *L. D.* *Quicksilver with Chalk.*

Take of
Purified quicksilver, . . . three ounces;
Prepared chalk, ... five ounces.
Triturate them together until the globules disappear. *L.*

Quicksilver has a strong affinity for oxygen, and absorbs it slowly from the atmosphere. But the combination may be considerably accelerated by agitation, and still more by triturating quicksilver with any substance which promotes its mechanical division, and thus increases its surface. With this view, quicksilver is triturated with viscid substances, as fats, honey, syrup, &c., or with pulverulent substances, as the chalk in the present example.

The black oxyd is the mildest, but at the same time the most efficacious of the preparations of mercury. Combined with chalk it is not in general use; but in the form of the common mercurial pill and ointment, it is more employed than any other preparations of the same metal except calomel.

Hydrargyrum cum Magnesia. *D.* *Quicksilver with Magnesia.*

Take of
Quicksilver,
Magnesia, each . . . one ounce;
Manna, ... half an ounce.
Triturate the quicksilver with the manna, in an earthen-ware mortar, adding some drops of water, to give the mixture the consistence of a syrup, until the metallic globules become no longer visible. Then add, with constant trituration, a drachm of the magnesia.
After they are thoroughly mixed, rub into them a pint of warm water, and shake the mixture: then let the liquor rest, and decant from the sediment as soon as it subsides. Repeat this washing twice, that the manna may be totally washed away, and, with the sediment still moist, mix the remainder of the magnesia. Lastly, dry the powder on blotting paper. *D.*

HYDRARGYRI SUBSULPHAS FLAVUS. *A. D.*

OXYDUM HYDRARGYRI SULPHURICUM. *D.*

TURPETHUM MINERALE. *Turpeth Mineral.*

Yellow Sub-Sulphat of Quicksilver. Sulphuric Oxyd of Quicksilver.

Take of
Purified quicksilver, . . . four ounces;
Sulphuric acid, ... six ounces.

Put them into a glass cucurbit, and boil them in a sand bath to dryness. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which must be frequently washed with warm water. *E.*

The action of sulphuric acid on mercury has been examined with considerable attention by Fourcroy. In the cold they have no action on each other, but on the application of heat, the sulphuric acid begins to be decomposed, sulphurous acid gas is extricated, and the metal is oxydized, and combines with the undecomposed acid, forming with it a white saline mass, covered with a colourless fluid. In this state it reddens vegetable blues, is acrid and corrosive, does not become yellow by the contact of the air, and is not decomposed by water either warm or cold. It is therefore super-sulphat of quicksilver, and the proportion of the acid in excess is variable.

By washing the saline mass repeatedly with small quantities of water, it is at last rendered perfectly neutral. It no longer reddens vegetable blues. It is white; it crystallizes in plates, or fine prismatic needles; it is not very acrid; it is not decomposed either by cold or boiling water: but is soluble in 500 parts of the former, and in about 250 of the latter. It is much more soluble in water acidulated with sulphuric acid. The following estimates of its composition have been made:

	Fourcroy.	Braamcamp and Sigueira.
Quicksilver	75.	57.42.
Oxygen,	8.	6.38.
Sulphuric acid,	12.	31.8.
Water,	5.	4.4.
	100.	100.

But if, instead of removing the excess of acid from the super-sulphat of quicksilver, by washing it with water, we continue the action of the heat according to the directions of the colleges, there is a copious evolution of sulphurous acid gas, and the saline residuum is converted into a white mass, which therefore evidently contains both a larger proportion of mercury, and in a state of greater oxydizement, than the salt from which it was formed. But this white saline mass is farther analysed by the infusion of hot water; for

one portion of it is dissolved, while the remainder assumes the form of a beautiful yellow powder. The portion dissolved is said to contain excess of acid. The yellow powder is, on the contrary, a sub-sulphat.

The sub-sulphat of quicksilver has a bright yellow colour, a considerable acrid taste, is soluble in 2000 parts of cold water, is also soluble in sulphuric acid, slightly diluted, and is decomposed by the nitric acid, and forms muriat of quicksilver with the muriatic acid, while the neutral sulphat forms sub-muriat. It oxydizes quicksilver, and is converted by trituration with it into a black powder. At a red heat it gives out oxygen gas, and the metal is revived. It consists of 76 mercury, 11 oxygen, 10 sulphuric acid, and 3 water.

Medical use.—It is a strong emetic, and with this intention operates the most powerfully of all the mercurials that can be safely given internally. Its action, however, is not confined to the primæ viæ; it will sometimes excite a salivation, if a purgative be not taken soon after it. This medicine is used chiefly in virulent gonorrhœas, and after venereal cases, where there is a great flux of humours to the parts. Its chief use at present is in swellings of the testicle from a venereal affection; and it seems not only to act as a mercurial, but also, by the severe vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected. It is said likewise to have been employed with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions: the dose is from two grains to six or eight. It may be given in doses of a grain or two as an alterative and diaphoretic.

It is an excellent errhine, mixed with snuff, or the powder of Asarum; and has been usefully employed as such in affections of the eyes and ears. It is stated by Dr. Barton to have produced salivation in two cases under his care, by such topical application.

This medicine was lately recommended as the most effectual preservative against the hydrophobia.

HYDRARGYRUM SULPHURETUM NIGRUM. *A. D. L. E.*

Black Sulphuret of Mercury. Æthiop's Mineral.

Take of
Purified quicksilver,
Sublimed sulphur, of each, equal weights.
Grind them together in a glass or earthen mortar with a glass pestle, till the mercurial globules totally disappear. *E. D.*
It is also prepared with twice the quantity of quicksilver. *E.*

This process, simple as it appears, is not, even in the present advanced state of chemistry, perfectly understood. It was formerly imagined, that the quicksilver was merely mechanically divided, and intimately mixed with the sulphur. But that they are really

chemically united, is indisputably proved by the insolubility of the compound in nitrous acid. Fourcroy is of opinion, that during the trituration, the mercury absorbs oxygen, and is converted into the black oxyd, and that in this state it is slightly combined with the sulphur. The editors of Gren also suppose it to be in the state of black oxyd, but that it is combined with hydrogureted sulphur, and they direct a little water to be added during the trituration, that by its decomposition it may facilitate the process.

The black sulphuret of quicksilver, thus prepared by trituration, has a pulverulent form, is insoluble in nitric acid, is totally soluble in a solution of potass, and is precipitated unchanged from this solution, by acids. It is not altered by exposure to the air; and when heated in an open vessel, it emits sulphurous acid gas, acquires a dark violet colour, and, lastly, sublimes in a brilliant red mass, composed of crystalline needles.

The combination of quicksilver with sulphur may be much more speedily effected by the assistance of heat, by pouring the mercury, previously heated, upon the sulphur in a state of fusion, and stirring them until they cool, and form a consistent mass, which may be afterwards powdered. The sulphuret prepared by fusion, differs, however, from that prepared by trituration; for it is not soluble in a solution of potass, but is converted by long ebullition in it into the red sulphuret, and it also reddens spontaneously in course of time from the action of the air.

Black sulphuret of mercury may be also prepared in the humid way, as it is called, by precipitation, or even by direct solution. According to Berthollet, mercury agitated with sulphureted hydroguret of ammonia, forms a black sulphuret exactly resembling that prepared by trituration; but if hydrogureted sulphuret of ammonia be used, the black precipitate formed gradually assumes a red colour, and the solution contains sulphureted hydroguret of ammonia. The same phenomena take place with all the mercurial salts.

As a medicine, black sulphuret of quicksilver possesses no very conspicuous effects. It is principally used as an alterative in glandular affections, and in cutaneous diseases. It has been commonly given in doses of from five to ten grains; but even in doses of several drachms, and continued for a considerable length of time, it has scarcely produced any sensible effect.

HYDRARGYRI SULPHURETUM RUBRUM. *A. D. L.*

Red Sulphuret of Mercury. Cinnabar.

Take of
  Purified mercury, . . . forty ounces;
  Sublimed sulphur, . . . eight ounces.

Having melted the sulphur over the fire, mix in the mercury, and as soon as the mass begins to swell, remove the vessel from the fire, and cover it with considerable force, to prevent combustion; then rub the mass into powder, and sublime.

As soon as the mercury and sulphur begin to unite, a considerable explosion frequently happens, and the mixture is very apt to take fire, especially if the process be somewhat hastily conducted. This accident the operator will have previous notice of, from the matter swelling up, and growing suddenly consistent; as soon as this happens, the vessel must be immediately close covered.

During the sublimation, care must be had that the matter does not rise into the neck of the vessel, so as to block up and burst the glass. To prevent this, a wide-necked bolt head, or rather an oval earthen jar, coated, should be chosen for the subliming vessel. If the former be employed, it will be convenient to introduce at times an iron wire, somewhat heated, in order to be the better assured that the passage is not blocking up; the danger of which may be prevented by cautiously raising the vessel higher from the fire.

If the ingredients be pure, there is no residuum. In such cases, the sublimation may be known to be over, by introducing a wire as before, and feeling with it the bottom of the vessel, which will then be perfectly smooth: if any roughness or inequalities be perceived, either the mixture was impure, or the sublimation is not completed; if the latter be the case, the wire will soon be covered over with the rising cinnabar.

M. M. Tucckert and Paysse have described, from actual observation, the process followed in the manufactory of M. Brand at Amsterdam, where 48,000 pounds of cinnabar are annually prepared. 150 pounds of sulphur are mixed with 1080 pounds of mercury, and exposed to a moderate heat in a bright iron-kettle, one foot deep, and two and a half in diameter. The black sulphuret of mercury, thus produced, is reduced to powder, and put up in earthen pots capable of containing about a quart of water. The subliming apparatus consists of three large coated crucibles, bound with iron, and surmounted with domes of iron, through the top of which the black sulphuret is introduced. These are built into a furnace, in such a manner that two-thirds of each apparatus is exposed to the action of the flame, which circulates freely around them. The fuel made use of is turf, which is found preferable to all others, probably from its affording a steady and moderate heat. The fire is kindled in the evening; and when the crucibles have become red, the pots containing the black sulphuret are emptied into them successively, at first one into each, and afterwards two, three or more, at a time, according to the violence of the inflammation which succeeds. Sometimes the flame rises four, or even six feet above the domes; when its violence is a little abated, the aperture is covered closely up with a lid of iron. In this manner the whole quantity is introduced into the three crucibles in about thirty-four hours. The fire is steadily supported in a proper degree for thirty-six hours, and the sublimation assisted by stirring the matter every quarter of an hour with a triangle of iron, until the whole is sublimed, when the fire is allowed to expire. The colour of the flame changes during the process from a dazzling white to a yellow white, orange yellow, blue and yellow, green, violet, and blue and green. When it acquires a

fine sky-blue, or indigo colour, and rises only an inch or two above the aperture, the aperture is closed hermetically, and luted with clay and sand. After the apparatus has cooled, 400 pounds of sublimed red sulphuret of mercury are found in each, so that there is a loss of 30 pounds on the 1230 of materials employed. The process by which cinnabar is converted into vermilion, is kept a secret by the Dutch; but M. Paysse discovered, that by keeping some levigated cinnabar in the dark, covered with water, and stirred frequently for a month, it acquires the brilliant colour of Chinese vermilion. Triturating the vermilion with urine, appears to increase the beauty of its colour.

When taken out of the subliming vessels, the red sulphuret of quicksilver is a brilliant crystalline mass, and first acquires its very rich colour when reduced to the form of a fine powder by trituration. It has neither smell nor taste, and is insoluble in water and in alcohol. In close vessels it sublimes entirely unchanged, but requires for this purpose a pretty great degree of heat. It is not soluble in any acid, and is only decomposed by the nitro-muriatic, which dissolves the quicksilver, and separates the sulphur. It is not decomposed by boiling it with solutions of the alkalies, but is decomposed by melting it with potass, soda, lime, iron, lead, copper, antimony, and several other metals. Proust has proved it to consist of 85 quicksilver, and 14 or $14\frac{1}{2}$ sulphur, and that the quicksilver is not oxydized to a maximum, as had been falsely supposed, but is in its metallic state. His analysis is confirmed by the other methods by which cinnabar may be prepared. Thus, the black sulphuret of quicksilver, by fusion, is converted into the red sulphuret, by boiling it in a solution of potass, which can only act by dissolving the sulphureted hydrogen and superfluous sulphur. Sub-muriat, or sub-sulphat of mercury, sublimed with sulphur, furnish red sulphuret of mercury, and muriat or sulphat of mercury.

Medical use.—Red sulphuret of quicksilver is sometimes used in fumigations against venereal ulcers in the nose, mouth and throat. Half a drachm of it burnt, the fume being imbibed with the breath, has occasioned a violent salivation. This effect is by no means owing to the medicine as a sulphuret; for when set on fire, it is no longer such, but mercury resolved into vapour, and blended with the sulphurous acid gas; in which circumstances this mineral has very powerful effects.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers or large and numerous eruptions, and, in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce a ptyalism rapidly, and great consequent debility, and that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system, by inunction, as if no fumigation had been employed.

Fictitious cinnabar is prepared in India under the name of *Shengerf*, by the following process: Mercury and sulphur are triturated

together to a black sulphuret; they are then sublimed in a glazed earthen pot, with another inverted over it, and both luted together.

Asiatic Researches, 11. 190.

Phosphas Hydrargyri.

Take of
  Sulphuric acid, . . . eight ounces;
  Water, ... four pounds.
Mix them carefully in a capacious glass vessel, and add
  White calcined bones powdered, 14 ounces.

Place the vessel in a temperature of 60° for three days to digest, stirring the mixture frequently with a glass rod, then filter the whole through fine linen, washing the residuum with distilled water till completely edulcorated. Evaporate to dryness, and dissolve in the smallest possible quantity of luke-warm water, by which a considerable portion of gypsum will remain undissolved. After straining off all the liquor, again dilute with distilled water and a solution of the purest potass, till it be completely saturated. The small portion of gypsum still held in solution will thus be decomposed, and some calcareous earth precipitated, which must be separated by filtration. Evaporate to a proper consistence, and expose in a cool place to crystallize. A small portion of vitriolated tartar first appears from the decomposition of the gypsum; but if the liquor be again evaporated, the phosphorated potass will be produced in rhomboidal prismatic crystals. Dissolve these in distilled water, and decompose by a super-saturated solution of mercury in the nitric acid. The precipitate after complete edulcoration with warm distilled water should be slowly dried, and is the purest phosphat of mercury.

The above is Bergmann's method of procuring the phosphat of mercury. It may be also obtained, by adding phosphoric acid in a liquid form to a solution of mercury in nitric acid.*

Phosphat of mercury is a very active preparation, and requires to be used with great caution, as it is otherwise apt to produce nausea, violent vomiting, ptyalism, &c. even in doses not exceeding half a grain. The following formula is employed to prevent these effects.

Take of
  Phosphat of mercury, . . . four grains;
  Powdered cinnamon, . . . fourteen grains;
  White sugar, ... half a drachm.
Mix and make into eight powders, of which one is to be taken every morning and evening, unless ptyalism is induced, when it must

* An easier method appears to be the union of a solution of phosphat of soda, and nitrat of mercury. The superior affinity of the nitric acid to soda, causes it to leave the mercury, whilst the phosphoric acid unites with the mercury in the form of a fine white precipitate, which is the phosphat of mercury, and which must be thoroughly edulcorated with boiling distilled water.—*Am. Editor.*

be suspended. Some bear from one to two grains, without inconvenience.

This remedy heals inveterate venereal ulcers in a short time, especially such as are seated about the pudenda. In venereal inflammations of the eyes, chancres, rheumatisms and chronic eruptions, it has proved of eminent service. It is a most valuable medicine in the hands of a judicious practitioner

It is particularly preferable over other mercurial preparations in an inveterate stage of syphilis, especially in persons of torpid insensible fibres; in cases of exostosis, as well as of obstructions in the lymphatic system; and in chronic complaints of the skin, &c.*

HYDRASTIS CANADENSIS. *Yellow Root.*

This is a common plant in various parts of the United States. The root is a very powerful bitter. When dried, it has a strong and virose smell. A spiritous infusion of the root is employed as a tonic bitter in the western parts of Pennsylvania. A cold infusion of the root in water is also used as a wash in inflammation of the eyes. The Cherokee Indians employ a plant in the cure of cancer, which is thought to be the Hydrastis. The root supplies us with a most brilliant yellow colour, which will probably be found a most valuable dye.†

HYOSCYAMUS. *A.* HYOSCYAMUS NIGER. *E. L. D.*

Henbane. Common Henbane. The Plant. The Herb and Seeds.

Pentandria Monogynia.—Nat. ord. *Solanaceæ.*

Henbane is an annual plant, which grows in great abundance in most parts of Britain, by the road sides, and among rubbish, and flowers in July. Its smell is strong and peculiar, and when bruised, something like tobacco, especially when the leaves are burnt; and on burning, they sparkle, as if they contained a nitrat: when chewed, however, they have no saline taste, but are insipid, mild, and mucilaginous. Henbane, in a moderate dose, often produces sweat, and sometimes an eruption of pustules, and generally sound sleep, succeeded by serenity of mind, and recruited vigour of the body; but like the other narcotics, instead of these, it sometimes gives rise to vertigo, headach, and general uneasiness. With particular individuals, it occasions vomiting, colic pains, a copious flow of urine, and sometimes purging. In excessive doses, its effects are fatal; general debility, delirium, remarkable dilatation of the pupils of the eyes,

* London Medical and Physical Journal.

† Barton's Collections, Part I. p. 2. Part II. p. 13.

convulsions, death. Upon the whole, like opium, it is a powerful anodyne; and like cicuta, it is free from any constipating effect, having rather a tendency to move the belly.

Medical use.—From the writings of Dioscorides and others, it appears, that different species of henbane have been long used in the practise of medicine. By Celsus it was applied externally as a collyrium in ophthalmia; for allaying the pain of the tooth-ach; and he gave it internally as an andoyne.

Its use, however, was for a long period entirely relinquished, until revived by Dr. Stork of Vienna, in those cases where an anodyne is requisite, and where there are objections to the use of opium. It is employed in wandering rheumatic pains, in indurations of the mammæ from retained milk, painful swellings, whether scirrhous or not, scrofulous and cancerous ulcers, inflamed piles, and spasms of the bowels from increased irritability; under the form of a cataplasm of the bruised leaves, with bread and milk; of an ointment, made of the powder of the leaves, with wax and oil; of a simple powder, sprinkled on the sore, or of a decoction in milk as an injection. An infusion prepared by digesting the bruised leaves in olive oil, is also usefully applied in inflammation of the bowels, kidneys, testicles, urethra, painful retention of urine, and in blind piles.

An extract from the leaves, or from the seeds, is the form in which it is given internally; and it has been used with advantage in a variety of nervous affections, as mania, melancholia, epilepsy, hysteria, trismus, and spasms from injured nerves, in rheumatism and arthritis, in glandular swellings, in obstinate ulcerations, and in every case where it is desirable either to allay inordinate action, or to mitigate pain, its dose may be gradually increased from half a grain. Collin pushed it to the length of 30 grains for a dose.

The extract of henbane has been lately much used by oculists for dilating the pupils of the eyes, in order to facilitate the extraction or breaking down of the cataract, to diminish sensibility, to destroy adhesions, to reduce protrusions of the iris, and to dilate contraction of the pupil. The mode of application is by dropping a few drops of solution of the extract in the eye, or applying them with a camel's hair brush. The greatest effect is produced in about four hours, and it is generally over in twelve. Vision is not impaired during its action.

HYSSOPUS OFFICINALIS. *E. D.*

Hyssop. The Herb and Leaves.

Hyssop is a perennial herb, which grows wild in Germany. Its leaves have an aromatic smell, and a warm pungent taste. Their virtues depend entirely on an essential oil which rises in distillation both with water and alcohol. Besides the general virtues of aroma-

tics, they were formerly recommended in humoral asthmas, coughs, and other disorders of the breast and lungs, and were said to promote expectoration.

I. J.

ICHTHYOCOLLA. *A. D.* *Isinglass. Fish-glue.*

Isinglass is prepared from many species of Acipenser. The Dublin College specify the A. *Sturio* or Beluga, and the A. *Ruthenus* or Sterlet; besides which, a great deal is obtained from the A. *Sturio*, the Sturgeon, and A. *Stellatus*, the Serruga.

The preparation of isinglass is almost peculiar to Russia. It is made in all places where the large species of sturgeon are caught, as on the Dnieper, the Don, and especially on the Caspian sea, also on the Volga, the Ural, the Oby, and the Irtysh. That prepared from the sturgeon is reckoned the best, and next to it that from the beluga. It also varies according to the mode of preparation. On the Volga and Ural, the sounds are watered while fresh, and dried to a certain degree. The outer skin is next taken off, and the inner glossy white membrane is twisted into proper shapes, and then completely dried. The best is usually rolled into the form of a snake or heart; the second folded in leaves, like a book; and the worst is dried without any care. In other places, as at Gurief, fish glue is extracted from the sounds by boiling. This is cut into slabs or plates, is perfectly transparent, and has the colour of amber. On the Okka, where the sterlet only is to be had, the sounds are beat just as they are extracted from the fish, and dried into glue.

It appears that this valuable article is likely to become an article of domestic manufacture; Mr. Waldron of Westchester county, New York, asserts that the vesicula natatoria of a certain fish frequent on the coast of the United States affords it.

Good isinglass is white, in some degree transparent, dry, composed of membranes not too thick, and without any smell.

The properties of isinglass depend entirely on the gelatin,* of

* *Gelatin*, when exsiccated, is a hard, elastic, semi-transparent substance, resembling horn, having a vitreous fracture: unalterable in the air, soluble in boiling water, and forming with it a gelatinous mass on cooling; it is also soluble, but less readily, in cold water. It is completely insoluble in alcohol, and is even precipitated by it from its solution in water; it is soluble in acids, even when much diluted, and also in the alkalies; but its most characteristic property is its affinity for tannin, with which it forms a thick yellow precipitate, which soon concretes into an adhesive, elastic mass, readily drying in the air, and forming a brittle substance, of a resinous appearance, exactly

which it principally consists. One hundred grains of good isinglass were found by Mr. Hatchett to contain rather more than 98 of matter soluble in water. A nutritious jelly may be prepared from it. A watery solution of it is used as a test of the presence of tannin, and for the clarification of spirituous liquors. Mr. Davy's solution for the former purpose consists of 120 grains of isinglass dissolved in twenty ounces of water, and if properly made, at temperatures below 50° Fahr. it has a tendency to gelatinize.

It is also said to be employed for the preparation of English court-plaster.

INFUSA.—*INFUSIONS.*

Infusions are solutions made from vegetables either with hot or cold water, without boiling. If hot water is employed, the infusion must be carried on in covered vessels, and in a warm place.

Infusions should be prepared only a short time before they are used.

The term infusion is confined to the action of a menstruum, not assisted by ebullition, on any substance consisting of heterogeneous principles, some of which are soluble, and others insoluble, in that menstruum. The term is generally used in a more extensive, but we are inclined to think, a less correct sense: thus, lime-water and the mucilages, which are commonly classed with the infusions, are instances of simple solution, and the chalk mixture is the mechanical suspension of an insoluble substance. When the menstruum used is water, the solution is termed simply an *infusion;* but when the menstruum is alcoholic, it is called a *tincture;* when wine or vinegar, a *medicated wine* or *vinegar*. Infusions in water are extremely apt to spoil, and are generally extemporaneous preparations.

INFUSUM ANTHEMIDIS. *A. E. L.* *Infusion of Chamomile.*

Take of

Chamomile, . . . two drachms;

Cold water, . . . half a pint.

Macerate for eight hours in a covered vessel, and strain.

resembling overtanned leather, very soluble in ammonia, and soluble in boiling water. It is also precipitated copiously by carbonat of potass. The solution of gelatin in water first becomes acid, and afterwards putrid. When decomposed by nitric acid or heat, its products show that it contains only a small proportion of nitrogen. It is principally contained in the cellular, membranous, and tendinous parts of animals, and forms an important article of nourishment. Glue and isinglass, which are much employed in the arts, are almost pure gelatin.

INFUSUM ANGUSTURÆ. *A.* Infusum Cuspariæ. *L.*

Infusion of Angustura.

Take of
Angustura bark, bruised, . . . two drachms;
Boiling water, ... half a pint.
Macerate for two hours, in a loosely covered vessel, and strain.

A stimulating febrifuge.

INFUSUM ARMORACIÆ. *A. L.* *Infusion of Horse-radish.*

Take of
Horse-radish, sliced,
Mustard, bruised, of each, . . . one ounce;
Boiling water, ... one pint.
Infuse for two hours in a covered vessel, and strain.

INFUSUM CASCARILLÆ. *A. L.* *Infusion of Cascarilla.*

Take of
Cascarilla root, bruised, . . . half an ounce;
Boiling water, ... half a pint.
Macerate for two hours, in a loosely covered vessel, and strain.

An aromatic stimulant.

INFUSUM COLOMBÆ. *A. E. L.* *Infusion of Colombo.*

Take of
Colombo root, sliced, . . . one drachm;
Boiling water, ... half a pint.
Macerate for two hours in a loosely covered vessel, and strain.

A stomachic bitter.

INFUSUM CINCHONÆ. *A. L.*

Infusum Cinchonæ Lancifoliæ (Officinalis.) *E.*

Infusion of Peruvian Bark.

Take of
Peruvian bark, bruised, . . . half an ounce;
Boiling water, ... half a pint.
Infuse for two hours in a covered vessel, and strain.

Infusum Cinchonæ sine Calore. *D.*

Cold Infusion of Cinchona.

Take of
Peruvian bark, in coarse powder, . . . one ounce;
Cold water, ... twelve ounces by measure.
Triturate the bark with a little of the water, and add the remainder during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This is a very elegant form of exhibiting the active principles of cinchona bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration directed by the Dublin College will promote the solution. The residuum of the cold infusion may be afterwards employed in making other preparations, especially the extract, for its virtues are by no means exhausted. But it must never be dried, and sold, or exhibited in substance, for that would be a culpable fraud.

INFUSUM CINCHONÆ CUM AQUA CALCIS. *A.*

Infusion of Peruvian Bark with Lime Water.

Take of
Peruvian bark, in powder, . . . one ounce;
Lime water, ... one pint.
Add the lime water gradually, and rub them well together for fifteen minutes. Let them stand for one hour, then filter.

What peculiar benefit is anticipated from the lime, we are unable to discern. If the lime is not converted into a carbonat during the process, the amount at least (about sixteen grains of lime), seems too insignificant to expect much from its use.

INFUSUM CINCHONÆ CUM MAGNESIA. *A.*

Infusion of Peruvian Bark with Magnesia.

Take of
Peruvian bark, in powder, . . . one ounce;
Magnesia, ... one drachm;
Cold water, ... one pint.
Add the water gradually, and rub them well together for fifteen minutes. Let the infusion stand for one hour, then filter!

We should be glad to know what becomes of the magnesia, as a medicine, after the filtration! It is indeed by some supposed, that the magnesia improves the preparation of the bark, by its alkaline properties; this is, however, problematical.

INFUSUM CINCHONÆ CUM SUCCO LIMONUM. *A.*

Infusion of Peruvian Bark with Lemon Juice.

Take of
- Peruvian bark, in powder, ... one ounce;
- Juice of lemons, ... two fluid ounces;
- Opiated tincture of camphor, . . three fluid drachms;
- Cold water, ... one pint.

Macerate for twelve hours in a covered vessel, and strain.

These three formulas are intended, we presume, to augment *somehow,* the powers of the simple infusion of the bark. We would willingly explain it if we understood the rationale, but the Pharmacopœia throws no light upon the subject!!

INFUSUM DIGITALIS. *A. L. E.* *Infusion of Foxglove.*

Take of
- Foxglove, dried, ... one drachm;
- Boiling water, ... half a pint;
- Spirit of cinnamon, ... one fluid ounce.

Infuse the foxglove for four hours in a covered vessel, strain, and add the tincture of cinnamon.

This is the infusion so highly recommended by Withering. Half an ounce, or an ounce of it, may be taken twice a day in dropsical complaints. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

INFUSUM EUPATORII. *A.* *Infusion of Thoroughwort.*

Take of
- Thoroughwort, . . . one ounce;
- Boiling water, . . . one pint.

Infuse for two hours in a covered vessel, and strain.

The virtues of this may be learned by reference to the article Eupatorium.

INFUSUM GENTIANÆ COMPOSITUM. *A. E. L. D.*

INFUSUM AMARUM.

Compound Infusion of Gentian, or Bitter Infusion.

Take of
- Bruised gentian root, ... half an ounce;
- Dried peel of Seville oranges, . . . one drachm;
- Coriander seeds, ... half a drachm;
- Diluted alcohol, ... four ounces;
- Water, ... one pint.

First pour on the alcohol, and three hours thereafter add the water; then macerate without heat for twelve hours, and strain.

This infusion is an extremely good bitter, and is of great service in all cases where bitters in general are necessary It strengthens the stomach, and increases the appetite; besides acting as a tonic on the other parts of the body, and on the vascular system.

INFUSUM LINI. *A. E. L.* *Infusion of Linseed.*

Take of
Linseed, bruised, ... one ounce;
Liquorice root, sliced, . . . half an ounce;
Boiling water, ... two pints.
Macerate for four hours near the fire, in a loosely covered vessel, and strain.

This is a mucilaginous emollient liquor, much used in gonorrhœa, strangury, and in pectoral complaints.

INFUSUM QUASSIÆ. *A. E. L.* *Infusion of Quassia.*

Take of
Quassia, rasped, ... one drachm;
Cold water, ... half a pint.
Macerate for twelve hours, and strain.

The quassia is here unnecessarily large in amount, the Edinburgh and London Colleges employ, the one, a scruple, the other, half a drachm; this last is fully adequate to produce a most intensely bitter infusion. Dose, one to two ounces.

INFUSUM QUASSIÆ CUM SULPHATE ZINCI. *A.*

Infusion of Quassia with Sulphat of Zinc.

Take of
Quassia, rasped, . . . one drachm;
Sulphat of zinc, ... eight grains;
Cold water, ... half a pint.
Macerate for twelve hours, and strain.

INFUSUM ROSÆ COMPOSITUM. *A.*

INFUSUM ROSÆ (GALLICÆ. *E.*) *L. D.*

Compound Infusion of Roses.

Take of
Roses, dried, ... half an ounce;
Boiling water, ... two pints and a half;
Diluted sulphuric acid, . . three fluid drachms;
White sugar, ... one ounce and a half.

Pour the water upon the roses in a glass vessel; then mix in the acid, and infuse for half an hour. Lastly, strain the infusion, and add the sugar to it.

In this infusion the rose leaves have very little effect, except in giving the mixture an elegant red colour. Its sub-acid and astringent virtues depend entirely on the sulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hemorrhagies, and in all cases which require mild coolers and sub-astringents: it is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle.

Infusum Sennæ. *E. L. D.* *Infusion of Senna.*

Take of
- Senna, ... three drachms;
- Ginger, powdered, ... half a drachm;
- Boiling water, as much as will yield a filtered infusion of six ounces.

Macerate them for an hour, in a covered vessel, then filter. *D.*

INFUSUM SENNÆ COMPOSITUM. *A. E.*

Compound Infusion of Senna.

Take of
- Senna, ... one ounce and a half;
- Super-tartrat of potass, . . two drachms;
- Ginger, ... one drachm;
- Boiling water, ... one pint.

Infuse for an hour in a covered vessel, and strain.

INFUSUM SENNÆ ET TAMARINDI. *A. E. D.*

Infusion of Senna and Tamarinds.

Take of
- Senna, ... one drachm;
- Tamarind, ... one ounce;
- Coriander, bruised, . . . half a drachm;
- Brown sugar, ... half an ounce;
- Boiling water, ... half a pint.

Infuse for four hours, with occasional agitation, in a close earthen vessel not glazed with lead, and strain.

These are all excellent purgatives in doses of one or two ounces, and repeated if necessary.

INFUSUM SERPENTARIÆ. *A.*

Infusion of Virginia Snake-root.

Take of
  Virginia-snake-root, . . . half an ounce;
  Boiling water, ... half a pint;
Infuse for two hours in a covered vessel, and strain.

INFUSUM SPIGELIÆ. *A.* *Infusion of Carolina Pink.*

Take of
  Carolina pink-root, . . . two drachms;
  Boiling water, ... half a pint.
Infuse for four hours in a covered vessel, and strain.

INFUSUM TABACI. *A. L.* *Infusion of Tobacco.*

Take of
  Tobacco, ... one drachm;
  Boiling water, . . . one pint.
Infuse for one hour in a covered vessel, and strain.

INFUSUM ULMI. *A.* *Infusion of Slippery Elm.*

Take of
  Slippery elm bark, sliced, . . one ounce;
  Boiling water, ... one pint.
Infuse for twelve hours in a covered vessel, near the fire, with frequent agitation, and strain.

INFUSUM VALERIANÆ. *A. D.* *Infusion of Valerian.*

Take of
  Valerian, ... two drachms;
  Boiling water, . . . half a pint.
Infuse for an hour in a covered vessel, and strain.

Infusum Aurantii Compositum. *L.*

Compound Infusion of Orange-peel.

Take of
  Orange-peel, dried, . . . two drachms;
  Lemon-peel, fresh, . . . one drachm;
  Cloves, bruised, ... half a drachm;
  Boiling water, ... half a pint.
Macerate for ten minutes, in a loosely covered vessel, and strain.

A stomachic infusion.

Infusum Caryophyllorum. *L.* *Infusion of Cloves.*

Take of
 Cloves, bruised, . . . one drachm;
 Boiling water, ... half a pint.
Macerate for two hours in a vessel loosely covered, and strain.

An aromatic stimulant.

Infusum Menthæ Compositum. *D.* *Compound Infusion of Mint.*

Take of
 The leaves of spearmint, dried, ... two drachms;
 Boiling water, as much as will afford six ounces of the infusion, when filtered.
Digest for half an hour, in a covered vessel; strain the liquor when cold, and then add of
 Double refined sugar, ... two drachms;
 Oil of spearmint, ... three drops, dissolved in
 Compound tincture of cardamums, . . . half an ounce. Mix.

This infusion is slightly stimulating and diaphoretic, and forms a very agreeable herb-tea, which may be used in any quantity in diet, or as a vehicle for more active remedies.

Infusum Acaciæ Catechu; vulgo Infusum Japonicum. *E.*
Infusion of Catechu, commonly called *Japonic Infusion.*

Take of
 Extract of catechu, . . . two drachms and a half;
 Cinnamon, ... half a drachm;
 Boiling water, ... seven ounces;
 Simple syrup, ... one ounce.
Macerate the extract and cinnamon in the hot water, in a covered vessel, for two hours, then strain it, and add the syrup.

Extract of catechu is almost pure tannin. This infusion is therefore a powerfully astringent solution. The cinnamon and syrup render it a very agreeable medicine, which will be found serviceable in fluxes proceeding from a laxity of the intestines. Its dose is a spoonful or two every other hour. As this preparation will not keep above a day or two, it must always be made extemporaneously. The two hours' maceration, therefore, becomes very often extremely inconvenient; but it may be prepared in a few minutes by boiling, without in the least impairing the virtues of the medicine.

INFUSUM RHÆI PALMATI. *E.* *Infusion of Rhubarb.*

Take of
Rhubarb, bruised, ... half an ounce;
Boiling water, ... eight ounces;
Spirit of cinnamon, . . . one ounce;
Macerate the rhubarb in a close vessel with the water, for twelve hours; then having added the spirit, strain the liquor.

This appears to be one of the best preparations of rhubarb, when designed as a purgative; water extracting its virtues more effectually than either vinous or spirituous menstrua.

INFUSUM SIMAROUBÆ. *L.* *Infusion of Simarouba.*

Take of
Simarouba bark, bruised, . . . half a drachm;
Boiling water, ... half a pint.
Macerate for two hours in a loosely covered vessel, and strain.

A bitter aromatic.

INULA. *A.* INULA HELENIUM. *D.*

Elecampane. The Root.

This a very large downy perennial plant, sometimes found wild in moist rich soils. It flowers in July and August. The root, especially when dry, has an agreeable aromatic smell: its taste, on first chewing, is glutinous, and as it were, somewhat rancid; in a little time it discovers an aromatic bitterness, which by degrees becomes considerably acrid and pungent.

Neumann got from 480 grains of the dry root, 390 watery, and 5 alcoholic extract, and inversely 150 alcoholic, and 300 watery. In distillation alcohol elevated nothing; but the distilled water was first observed by Geoffroy to be milky, and mixed with flocculi of a cineritious concrete volatile oil, partly swimming, and partly sinking in the water. He also ascertained that it was fusible, and compares it to camphor or benzoic acid. Neumann likewise examined it, and considers it as a peculiar substance, having some resemblance to camphor. He found that it melts with a gentle heat, and when cold, appears softer and more unctuous; that it never assumes a crystalline form, but when dry proves opaque and crumbly; that laid on burning coals it totally exhales; that it is soluble in alcohol, but insoluble in water; and that by keeping it gradually loses the smell of elecampane. It has also been discovered by Rose to contain a matter having some analogy with starch, the properties of which have been described under the title of Inulin.

According to Funk's analysis, elecampane root contains, 1. A crystallizable volatile oil; 2. A peculiar feculum; 3. An extractive matter; 4. Free acetic acid; 5. A crystallizable resin; 6. Albumen; 7. Fibrous matter. The ashes contain carbonats of lime and magnesia, silica, and a trace of iron.

Medical use.—It is a gently stimulating medicine, nearly similar in its action to angelica. The extract is merely a slight bitter, as the essential oil is totally dissipated.

IODINE

Is of a black grey colour, resembling plumbago, and crystallized either in micaceous plates, or broad and brilliant rhomboidal plates, or long octohedrons. Its fracture is lamellated and greasy. It is very friable, and may be reduced to impalpable powder. It destroys vegetable colours, and stains the skin of a deep orange—not very permanent. Specific gravity 4.948. Not a conductor of electricity. Melts at 225 Fahrenheit, and boils between 335 and 355°. Its vapour is of a beautiful violet colour, resembling chlorine in smell, but weaker. Its taste is acrid, hot and durable, and it acts as a poison, although from Orfila's experiments it can scarcely be considered a violent one. Administered to dogs, in doses of one and a half to nearly three drachms, death did not ensue for several days; and taken by himself up to six grains, no permanent ill effects resulted.

Iodine has little affinity to water, which is said to dissolve only a seven-millionth part of its weight; when combined with water, it is vaporized along with it, at 212°.

It combines with combustible bodies, forming compounds called iodides, or iodurets. It combines with oxygen, forming the *iodic* acid, which is analogous to *chloric* acid. It is a white semi-transparent solid, inodorous; of a strong astringent sour taste. Specific gravity considerable; boils at 600°, without decomposition. It is deliquescent, and very soluble in water, rising unchanged with it. It alters vegetable colours, detonates with inflammables, and corrodes metals.

Iodine combines also with hydrogen, forming *hydriodic* acid, and with *chlorine*, constituting chloriodic acid.

Within a few months, Dr. Coindet has recommended iodine as a remedy in bronchocele. The following is extracted from the Quarterly Journal of Science and the Arts, No. 22.

"*Iodine, on its application as a Medicine.*—An abstract was given at page 191, vol. 10, of this Journal, from a paper, by Dr. Coindet, of Switzerland, on the application of iodine to the dissipation of the goitre. In consequence of the importance of any effectual remedy for this disease, in a country where it is so frequent, much attention has been drawn towards Dr. Coindet's discovery, and considerable opposition made to it. It happens, also, that from the number of cases in which it has been applied, much information, with regard to the general medicinal effects of this substance, has been obtained. These, with other rea-

sons, have induced Dr. Coindet to publish a second paper on the subject, which, as it contains some very interesting matter necessary to be known before the publication of the remedy can be said to be completed, we are induced to abstract at this time, though from the rarity of the disease in this country, it has not that high interest here it possesses in that part of the world.

"After having dwelt upon the necessity in every case of using prudence in the administration of a powerful medicine, especially when that medicine is new, and its action but little understood, Dr. Coindet mentions the circumstance that at Geneva alone one hundred and forty ounces of iodine have been sold since he first made known its use in this disease; consequently, that above one thousand persons have used it; and, he remarks, that fewer accidents have happened in the application of this quantity, than happens in a similar application of almost any powerful medicine.

"As the iodine in different states will act differently as a medicine, Dr. Coindet states, that of all the preparations he prefers the iodureted hydriodate of potassa. This is prepared by dissolving thirty-six grains of the hydriodate, and ten grains of iodine, in one ounce of distilled water; from six to ten drops in half a glass of water, sweetened, is given three times a day, diminishing or increasing the dose according to the effects.

"Dr. Coindet prepares the hydriodate of potassa by saturating potassa with hydriodic acid. The acid he prepares previously by passing sulphureted hydrogen gas through water holding iodine in suspension, or through a solution of iodine in alcohol. The sulphur is then filtered out, and the liquor heated to drive off the free sulphureted hydrogen. A much simpler mode of preparing the hydriodate would be, to saturate a strong solution of potassa with iodine, evaporate to dryness, and fuse the salt out of contact with air in a covered platinum crucible or glass flask, until the portion of iodate formed is decomposed and converted into iodide; the whole is then iodide of potassium, and only requires to be dissolved in water to form the hydriodate of potassa.

"Whilst attentively observing the action of this substance on the animal economy, it soon appeared, that if given in excess, it seemed to saturate the body, and then produced particular symptoms, which Dr. Coindet calls iodic. This never happens before an effect has taken place on the goitre; and, as the farther addition and action of iodine, beyond the dissipation of the mass, is injurious, a stop is immediately put to its administration when these effects appear. After eight or ten days its use is resumed, and continued until the symptoms are again observed, when it is discontinued, and again resumed after an interval of time, which is to be more or less, according to the state of the patient, and the effect of the medicine on him.

"The iodic symptoms, when strong, are as follows: accelerated pulse, palpitation, frequent dry cough, want of sleep, rapid loss of flesh and strength; with some, there is produced only a swelling of the legs, or tremblings, or a painful hardness of the goitre, sometimes diminished breasts, continued increase of appetite, and in all that Dr. Coindet had seen, a very rapid diminution and disappearance of the goitre.

"At those times Dr. Coindet forbade iodine, and prescribed milk, especially that of asses, warm baths, valerian, kino, carbonat of ammonia, preparations of opium, and other antispasmodics. In painful hardness of the goitre, leeches, and emollient fomentations.

"The rapid disappearance of the goitre, which accompanies these symptoms, shows them to be occasioned by an excess of iodine: from eight to ten weeks is considered the mean time of proper treatment.

"The iodine should not be administered indiscriminately in all cases of goitre: some are inflammatory, and some are accompanied by a bilious disposition of the body; in these cases, leeches should be applied on the goitre, and medicines administered as the case requires, before the iodine be given. If similar symptoms arise during the application of iodine, then those indications should be attended to, and proper medicines given with the iodine.

"Iodine should never be employed in cases where the patient is of a gross disposition, or tending to menorrhagia, or in cases where diseases of the breast

threaten to, or have commenced, or in slow fevers. It should also be refused to persons who are nervous, delicate, and of a feeble constitution

"Dr. Coindet then states his reasons for believing that iodine may be usefully employed in cases of amenorrhœa, in chronic diseases of the uterus, of indolent tumours of the lymphatic glands of the breast, cases of scrophula without fever, and where the enlarged glands of the neck are indolent; and concludes by expressing a strong wish that no person will resort to this remedy without the advice and observation of a physician.—*Bib. Univ.* xvi. p. 140.

IPECACUANHA. *A. E. L. D.* Callicocca Ipecacuanha.

Brotero, Transactions of the Linnæan Society, Vol. 7th.

Ipecacuanha. The Root.

Ipecacuan, in the language of South America, means vomiting root, and is applied to various vegetables which possess that property in any remarkable degree; hence the confusion and contradictions which have long prevailed concerning the plant which furnishes our officinal ipecacuan: and this confusion is increased by several varieties of ipecacuan being found in the shops.

1st. The ash-coloured or Peruvian ipecacuan, is a small wrinkled root, bent and contorted into a great variety of figures, brought over in short pieces, full of wrinkles and deep circular fissures, quite down to a small white woody fibre that runs in the middle of each piece: the cortical part is compact, brittle, looks smooth and resinous upon breaking: it has very little smell; the taste is bitterish and sub-acrid, covering the tongue as it were with a kind of mucilage. This, according to Mutis, is obtained from the psycotria emetica, and is that commonly used.

2d. The brown ipecacuan is small, and somewhat more wrinkled than the foregoing; its bark is of a brown or blackish colour without, and white within; this is brought from Brazil, and is the root of a cephaëlis, which is perennial, and grows in moist shadowy situations. A complete monography of it, and an excellent plate, were published in the sixth volume of the Transactions of the Linnæan Society, by professor Brotero, who calls it the callicocca ipecacuanha; but the genus callicocca has been united by Willdenow with that of cephaëlis, to which we have, therefore, referred it. The plate of Brotero corresponds with that published in Woodville's Medical Botany, vol. iii. from a plant sent in spirits from Brazil, by Governor Philips, to Sir Joseph Banks, but which unfortunately was not in flower; and also with the rude draught of Piso, who first examined it. It has been sometimes observed, even in a small dose, to produce violent effects.

3d. The white sort is woody, has no wrinkles, and no perceptible bitterness in taste. It is probably the root of a viola. Though taken in a large dose, it has scarcely any effect at all.

Besides these, the name of ipecacuan is given to various species of cynanchum, asclepias, euphorbia, Dorstenia, and Ruellia. With

regard to their comparative strengths, Decandolle says, that vomiting is produced by 22 grains of the cynanchum ipecacuanha, 24 of the psycotria emetica, 60 to 72 of the viola calceolaria, and one to three drachms of the viola ipecacuanha.

Ipecacuan was first brought into Europe about the middle of last century, and an account of it published at the same time by Piso; but it did not come into general use till about the year 1686, when Helvetius, under the patronage of Louis XIV. introduced it into practice. The root is one of the mildest and safest emetics with which we are acquainted; and has this peculiar advantage, that when it does not operate by vomiting, it passes off by other emunctories.

Without referring to preceding analyses, we shall observe, that the late researches of MM. Majendie and Pelletier have detected the existence of a new vegetable proximate principle in this root, to which ipecacuan is indebted for its emetic properties; they have, accordingly, denominated it *Emetin.** When pure, it assumes the form of transparent brownish red scales, which are nearly inodorous, but have a slightly bitter acrid but not nauseous taste. *Emetin* is decomposed by a heat higher than that of boiling water; it is soluble in water, in every proportion, without undergoing the least change; and in a moist atmosphere it deliquesces; it is also soluble in alcohol, but not in ether; *nitric acid* dissolves it, but at the same time decomposes it; *dilute sulphuric acid* has no action on it; *muriatic acid* and *phosphoric acid* dissolve it, without altering its nature; *acetic acid* dissolves it with great facility; *corrosive sublimate* precipitates it from its solutions, but *tartarized antimony* has no effect upon them; *gallic acid*, the *infusion of galls*, and *acetat of lead*, precipitate it. Half a grain excites violent vomiting, followed by sleep, and the patient awakes in perfect health! It exerts also a specific action on the lungs and mucous membrane of the intestinal canal; when taken in an overdose, its action can be instantly paralysed by a decoction of galls. *Emetin* appears to exist in ipecacuanha, combined in the following manner, *emetin* 16, oils 2, wax 6, gum 10, starch 40, woody fibre 20.—SOLUBILITY. Alcohol takes up four parts in twenty of ipecacuan; proof spirit, six and a half; and boiling water rather more than eight parts; one pint of good sherry wine will dissolve about 100 grains; the alcoholic is more emetic than the aqueous solution; decoction destroys the emetic property of the root.—INCOMPATIBLE SUBSTANCES. All vegetable astringents, as *infusion of galls*, &c. *vegetable acids*, especially the *acetic*, weaken

* A formula for its preparation is introduced in the new Parisian CODEX, being the one used by M. Pelletier; it is as follows: Let one ounce of the powder of Ipecacuan be macerated in two ounces of ether with a gentle heat for some hours, in a distilling apparatus; let the portion which remains be triturated and boiled with four ounces of alcohol, it having been previously macerated in it; filter, and let the remainder be treated with fresh portions of alcohol, as long as any thing is taken up from the root; mix these alcoholic solutions and evaporate to dryness; let this alcoholic extract be macerated in cold distilled water, in order that every thing soluble in that menstruum may be dissolved; filter, and evaporate to dryness; this extract is EMETIN. In this state, however, it contains a small quantity of *gallic acid*, but which is too inconsiderable to affect its medicinal qualities.

its power; Dr. Irvine found that thirty grains, administered in two fluid ounces of vinegar, produced only some loose stools.—FORMS OF EXHIBITION. The form of powder is most energetic, although the vinous solution is both active and convenient.—DOSE. The medicinal operation of this substance varies with its dose, thus ten grains to half a drachm, act as an emetic; from one to two grains, as an expectorant, and in still smaller doses it proves stomachic and diaphoretic; by combination with opium, this latter quality becomes more powerful. The primary effect of this medicine is that of stimulating the stomach, and it is equally obvious that its secondary ones depend on the numerous sympathies of other parts with the organs of digestion. The action of this remedy upon the pulmonary organs is extremely interesting; it would seem that in certain conditions of these organs, attended with a dry, hard cough, it promotes expectoration, while in affections attended with an inordinate secretion of mucus, it as certainly represses it, and acts the part of an astringent.

Medical use.—The primary effect of ipecacuan is that of stimulating the stomach. If the dose be sufficiently large it excites vomiting, by inverting the peristaltic motion of the stomach and duodenum; in a smaller dose, it only produces nausea, and operates by stool; and in still smaller doses, it generally stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of other parts with the stomach; and in this way only can we explain its action as an antispasmodic, diaphoretic, expectorant, and in checking hemorrhagies. Its beneficial effects in some cases also seem to be owing to the general concussion given to the whole system during the action of vomiting.

Ipecacuan, properly administered, often proves serviceable,

1. In intermittent fevers. It has frequently succeeded in stopping these, when given about an hour before an accession was expected, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage.
2. In continued fevers. Its beneficial effects are very decided in the commencement of typhus fever. An emetic, succeeded by a diaphoretic regimen, when administered sufficiently early in this disease, very frequently cuts it short at once, and when it fails in this desirable object, it always has a beneficial influence on the progress of the fever.
3. In inflammatory diseases, rheumatism, bubo, swelled testicle.
4. In exanthematous diseases, when the eruption is disposed to recede.
5. In hemorrhagies, when given in nauseating doses.
6. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specific against that disease. But Cullen attributes its good effects in this instance to its producing a steady determination of the peristaltic motion of

the intestines downwards, when given in repeated small doses.

7. In many spasmodic diseases; in epilepsy; asthma; dyspnœa; pertussis; chronic diarrhœa; hysteria; melancholia; mania.
8. In cachectic diseases, as in some kinds of dropsy.
9. In impetiginous diseases; in jaundice.
10. In local diseases; in amaurosis, and several of the dysorexiæ.
11. Lastly, in every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetic, is contra-indicated,

1. Where there is a disposition to hemorrhagy.
2. Where there is an increased flow of blood towards the head.
3. In very irritable subjects.
4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited,

1. In substance; in powder. Full vomiting will generally be produced in an adult by a scruple or half a drachm, and though less will answer the purpose, fortunately an over-dose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm watery fluids. On the contrary, when vomiting is not intended, liquids must be rather drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.
2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate.
3. Infused in wine.

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the best antidotes for its poison, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticular discharge.

It has recently been announced by Thomas Clark, M. D. an English physician, that a decoction of the root of ipecacuanha has been administered as injections in dysentery and internal piles with surprising success. The practice has been adopted by several physicians, all of whom testify their confidence in the superior efficacy of the remedy. Dr. Clark directs for an adult affected with dysentery three drachms of the bruised root to be boiled in a quart of water down to a pint, strained, and given all at once as a lavement, and repeated if necessary. In cases of internal piles, half that quantity will be sufficient. This mode of administering ipecacuan is not however a new one.

IRIS FLORENTINA. *A.* (*Secondary.*) *E.*

Florentine Orris. The Root.

This is a perennial plant, a native of the south of Europe. The dried roots are imported from Italy. They are white, flattish, knotty, and have a very slightly bitter taste, and an agreeable smell, resembling that of violets.

Neumann got from 480 parts, 77 alcoholic, and afterwards 100 watery; and inversely 180 watery, and 8 alcoholic. The distilled water smells a little of the root, but exhibits no appearance of oil. They are chiefly used as a perfume.

IRIS VERSICOLOR. *A.* (*Secondary.*)

Blue Flag, or Flower de Luce. The Root.

This is an active cathartic, and was used as such by the Indians. It occasions a distressing nausea, with prostration of strength; and is not likely to supersede other remedies of this nature. It is said to be an useful diuretic.

JUGLANS CINEREA. *A.*

Butternut, or White Walnut. The inner bark of the root.

This is an abundant tree in the United States. Its sap affords a sugar equal to the maple. An extract of the inner bark, especially of the root, is an efficacious and mild laxative in doses of from ten to twenty grains.

During the American war, the extract, made from the inner bark of this tree, attracted the attention of Dr. Rush, and other medical men in our military hospital; and, being frequently administered to patients under the operation of inoculated small-pox, it was proved to be an excellent substitute for jalap or other cathartics. It is now esteemed as a valuable purgative, in doses from ten to thirty grains, not occasioning heat or irritation; and is greatly commended in cases of dysentery. Conjoined with calomel it is rendered more active and efficacious, especially in bilious habits. As this extract is often very carelessly prepared by the country people, it ought to be prepared by the apothecaries, or practitioners themselves; and as a domestic medicine of considerable importance, it should be adopted by every physician. The bark of the root of this tree will excite a blister; and the bark and shells of the nuts dye a good brown colour. A decoction of the inner bark is advantageously employed as a cathartic in the disease of horses, called the *yellow water*. The extract should be made from the bark in the month of May or June.

JUNIPERUS. *A.* Juniperis Communis. *E. L. D.*

Juniper. Common Juniper. The Berries and Tops. The Oil.

This is an ever-green shrub, growing on heaths and hilly grounds in all parts of Europe: the berries are brought from Holland and from Italy.* The Italian berries are in general reckoned the best. Juniper berries have a strong not disagreeable smell, and a warm pungent sweet taste, which if they are long chewed, or previously well bruised, is followed by a bitterish one. Their predominant constituents are essential oil, and a sweet mucilaginous matter.

This shrub is also a native of the Northern States, seldom more than two or three feet high. The berries are said to be considerably inferior in strength and flavour to those of Europe.

Medical use.—To the oil they are indebted for their stimulating carminative, diaphoretic, and diuretic properties. They are most commonly used in the form of infusion, as a diuretic drink in dropsy. The essential oil may be separated by distillation. It possesses the same properties in a higher degree, and imparts them to ardent spirits. The peculiar flavour, and well known diuretic effects of Hollands, are owing to the oil of Juniper. The decoction and extract are very inert preparations, of the class of bitters.

Every part of the plant contains the same essential oil; therefore an infusion of the tops is likewise diuretic. The wood, also, was formerly officinal. In warm countries a resin exudes from the juniper-tree. It is called sandarac, and is often mixed with mastich. It is not a pure resin, for, according to Mr. Giese, about one-fifth of it is not soluble in water or in alcohol, but in ether; resembling in these respects copal.

JUNIPERUS VIRGINIANA. *A. Red Cedar. The Leaves.*

This species rises into a tree of considerable size, which Michaux found from Maine to the Cape of Florida; and its botanical distinction from the Juniperus Sabina, is by no means easy; in sensible and medicinal properties, they are said to be equally allied. It is frequently known throughout the country by the name of savin, and has long been used for the same purposes. The fresh leaves boiled for a short time in about twice their weight of lard, with a little wax, form an excellent cerate of peculiar efficacy as a perpetual epispastic; producing a change in the discharge from a serous to a puriform appearance.

Internally, the effects of the leaves are very similar to those of savin, as an emmenagogue, and general stimulant and diaphoretic in rheumatism. They have also had some reputation as a diuretic in dropsy.

Similar as it is in its effects, it would seem unnecessary to retain both it and the savin in our lists of medicines.

* The berries of the Juniper might be collected with little trouble, in sufficient quantities to prevent their importation into the United States.

JUNIPERUS LYCIA. *E. L. D. Olibanum. Gum Resin.*

Olibanum is principally collected in Arabia, and brought from Mecca to Cairo, from whence it is imported into Europe. It consists of transparent brittle grains of different sizes, not larger than a chesnut, of a red or yellow colour, having little taste, and a peculiar aromatic smell. Neumann got from 480 grains, 346 alcoholic, and 125 watery extract, and inversely 200 watery, and 273 alcoholic. The distilled spirit and oil both smelt of olibanum, but no oil separated. It forms a transparent solution with alcohol, and a milky fluid when triturated with water; it is not fusible, but inflammable, and burns with an agreeable smell. It is the frankincense of the ancients; and the diffusion of its vapour around the altar still forms part of the ceremonies of the Greek and Roman Catholic churches.

JUNIPERUS SABINA. *E. L. D.* SABINA. *A. Savin. The Leaf and Oil.*

This is an evergreen shrub, a native of Siberia and Tartary, but not unfrequent in our gardens. The leaves have a bitter, acrid, biting taste, and a strong disagreeable smell: distilled with water, they yield an essential oil, in considerable quantity.

Medical use.—Savin is a warm stimulating medicine, capable of producing diaphoresis, and increasing all the secretions, but apt to excite hemorrhagy, especially from the uterus. It is also recommended as an anthelmintic, and said to be very efficient in the cure of gout.

Internally, a conserve of the fresh leaves is exhibited in doses of from half a drachm to a drachm.

Externally, the leaves are applied in the form of powder or infusion, to warts, carious bones, and ulcers; and in cases of gangrene, psora, and tinea. The essential oil is a very active remedy. This plant is much employed by Farriers. A tincture of it is also sometimes used.

K.

KALMIA LATIFOLIA. *Broad leaved Laurel, &c.*

This plant kills sheep and other animals. The Indians use a decoction to destroy themselves. The powdered leaves are employed with success in tinea capitis, and in certain stages of fever. A decoction of it is used for the itch, but it should be cautiously applied. The brown powder attached to the footstalks of the leaves, and

about the seeds, is errhine. The powdered leaves with lard form an ointment in herpes. In syphilis this plant has seemed useful. A saturated tincture of the leaves in proof spirit, is an active remedy.*

KINO. *A. E. L. D.*

Extract of the Pterocarpus.

Kino. The inspissated juice of the brown gum-tree of Botany Bay. The resin of the Butea frondosa. The gum-resin of a non-descript African tree.

It may admit of some doubt, whether Mungo Park's last Journal, to which the United States' Pharmacopœia refers, is sufficient evidence of the kino being derived from the pterocarpus. The British Colleges do not notice it.

Kino was first noticed by Dr. Fothergill, who received it from a druggist as a very fine kind of dragon's blood, and described it as the produce of an African tree called the Pau de Sangue. In Moor's travels up the Gambia, there is a very imperfect account of the tree from which it exudes, and a copy of directions from the African company to their factors, to collect and purchase this gum: but it seems to have been brought to them only in very small quantities, and mixed with gum Senegal. This kind is no longer to be met with in commerce, and is not even mentioned by Mr. Jackson among the exports from Mogodore, or by Mr. Winterbottom, in his account of Sierra Leone.

In commerce are found three kinds of kino, easily distinguished by their external appearance.

The first is in very small jet-black fragments, perfectly opaque, without smell, crackling under the teeth when chewed, not colouring the saliva, after some time imparting only a slight astringent taste, not fusible, and difficultly reduced to powder. Powder, dark chocolate-brown. Although this has been the longest known in commerce in England, Dr. Duncan has not been able to trace the place of its origin.

The second is in large fragments, on some of which the impression of the vessel into which it had been received while fluid, and in which it had hardened, was evident; colour very dark brown, fracture resinous, appearance homogeneous, with small air bells; in very thin splinters, transparent, and of a ruby red colour: crackling under the teeth when chewed, taste at first somewhat acid, but afterwards becoming considerably bitter and astringent, succeeded by a peculiar sweetness; infusible, and friable; powder of a reddish-brown. This is said to be the extract of the Coccoloba uvifera or

* See Thomas's Inaugural Dissertation, 1802. Barton's Collections, Part I. p. 18, 24, 48. Part II. p. 26.

sea-side grape; and indeed by comparing it with the specimens of that extract, Dr. Duncan has no doubt of the accuracy of his information. The kino imported by the East India Company resembles this in many particulars, but is in smaller fragments.

The third is in dark brown masses of various sizes, either smooth or rounded on the surface, or in fragments often covered with a reddish-brown powder, fracture resinous and very unequal, appearance sometimes homogeneous, but more commonly heterogeneous, mixed with bits of twigs, leaves, &c.; splinters transparent, ruby red, no smell, scarcely crackling under the teeth, but sometimes gritty, from the accidental mixture of sand; taste simply astringent, succeeded by sweetness, and, when long chewed, a portion adheres to the teeth; infusible and friable; powder reddish-brown. This is certainly obtained from the Eucalyptus resinifera, or brown gum-tree of New South Wales, by allowing the juice, which either flows from it spontaneously, or is procured by wounding the tree, to harden in the sun. Some specimens of it in its fluid state have even reached Great Britain.

The Dublin College have indicated the butea frondosa as the source of kino, but certainly erroneously. It, however, produces in large quantities a red juice, very analogous to kino, and which may unquestionably be used as a substitute for it. The production of these substances, from so many different trees in Africa, America, Asia, and New Holland, show that kino is to be considered as a genus of which these are species.

The analysis of kino, published in the first editions of this Dispensatory, has since been confirmed by Vauquelin, as well as the conclusion drawn from it, that it consists principally of tannin, and cannot with propriety be classed among the resins or gum-resins. But the undoubted origin of the third kind, and the examination of a red astringent matter which Dr. Duncan picked from a cavity in a specimen of the Cassuarina, or beef-wood, prove that he was hasty in supposing that kino was always obtained from astringent barks by decoction and evaporation.

Kino is much more soluble in boiling than in cold water. The decoction, therefore, on cooling, becomes turbid with a very copious red sediment. The residuum seems to be softened by the heat of boiling water, at least it agglutinates into masses resembling melted red sealing wax dropt into water. By repeated decoctions with very large quantities of water, Dr. Duncan has never been able to exhaust it of its soluble parts: the last decoctions had still a deep red colour, and blackened solutions of iron. This residuum is not more soluble in alcohol than in water, and is not fusible, but when thrown on live coals burns away without flame. Vauquelin observed, that when the whole quantity of water necessary to dissolve the soluble parts of kino is not employed at once, the residuum becomes more insoluble. Alcohol dissolves the whole of the Botany Bay kino except its impurities. With a certain proportion of water, this tincture lets fall a copious red precipitate, which may be separated by filtration, but with a larger proportion of water its transparency is

only slightly disturbed. It is also remarkable, that alcohol dissolves kino entirely, but does not dissolve the residuum of the decoction. This fact would show, that the portion extracted by the water had the property of rendering the residuum insoluble in alcohol. The solutions of kino precipitate gelatin, and, according to Vauquelin, silver, lead, and antimony, white; and iron, green. It resembles other astringents, in forming a black precipitate with red sulphat of iron, which however is converted into green by the slightest excess of the sulphat, and by a larger excess is dissolved into a bright green liquid.

Medical use.—It is a powerful remedy in obstinate chronic diarrhœas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus; and in diseases arising from laxity of the solids.

It is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol.

Externally, it is applied as a styptic, to check hæmorrhagies from wounds or ulcers, and to diminish the discharge of sanious or ichorous matter from ill-conditioned ulcers.

L.

LACTUCA VIROSA. *E.* *Strong-scented Lettuce. Leaves.*

This plant is biennial, and grows wild on rubbish and rough banks in many places in Great Britain.

It smells strongly of opium, and resembles it in some of its effects; and its narcotic power, like that of the poppy heads, resides in its milky juice.

Medical use.—An extract, prepared from the expressed juice of the leaves of the plant, gathered when in flower, is recommended in small doses in dropsy. In dropsies of long standing, proceeding from visceral obstructions, it has been given to the extent of half an ounce a-day. It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretic, and somewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin of Vienna asserts, that out of twenty-four dropsical patients, all but one were cured by this medicine.

LACTUCA ELONGATA. *A.* (*Secondary.*)

Wild Lettuce. The Plant.

We presume its properties are analogous to the preceding. It seems an unnecessary addition to our lists.

LACTUCA SATIVA. *E. Garden Lettuce. The concrete milky juice.*

LACTUCARIUM. *A. E. Lettuce Opium.*

This plant, so valuable as an article of diet, abounds with a milky juice, which possesses all the characteristic properties of the opium of the shops, and may be procured from it in sufficient quantity to repay any labour bestowed on it for this purpose. A series of comparative experiments instituted for the purpose, and detailed in the fourth volume of the American Philosophical Transactions, 23 years ago, have assured me of the identity of the opium procured from the poppy and from this species of the lettuce. These experiments were made on frogs, as well as on the human subject. The laudanum from the opium of the lettuce, increases the pulse in force and frequency, and produces the same effects as result from similar doses of common laudanum. It has been used with advantage in allaying the pain of chronic rheumatism and colic; in checking the frequent stools accompanying diarrhœa; in allaying cough, &c.; and doubtless the plant might be advantageously cultivated for medical purposes, especially as the opium is procured after the period in which the plant is useful for the table. Dr. Duncan has published some observations on its various preparations.

The milky juice, if secured in closely stopped vials, and filled completely with it, does not change its colour, or but very little; I have two or three vials full, which are six years old, and though exposed to the light, have evinced little alteration. I presume therefore the change of colour which exposure produces, is dependent on the absorption of oxygen.

This juice has been analyzed by Mr. John, of Berlin, and found to consist of water, caoutchouc as its principal constituent, a trace of resin, a small quantity of bitter extractive, and phosphats, muriats and sulphats. This analysis may however be doubted of; since in every particular it is found identical with opium.

Although it is so long since I first demonstrated this fact, and the facility with which the opium might be procured from the plant; little notice was taken of it, until the venerable Dr. Duncan, sen. took up the subject in 1810, in a paper read to the Caledonian Horticultural Society, entitled "Observations on the preparation of soporific medicines from common garden lettuce." This paper may be seen in his observations on pulmonary consumption, in an appendix, and amply proves the value of the article in question. He has not, however, given me any credit for my *anterior* remarks in the American Philosophical Society's Transactions, or in the first edition of this Dispensatory, published in 1806; and to which I may claim a title. He has, indeed, in another communication to the same society in 1811, spoken of my observations and experiments; but in a way that might readily lead to the supposition, that his observations preceded mine.

I shall here introduce from his observations on consumption, the

"*Method of preparing the Inspissated Juice of Lettuce, or the Succus Spissatus Lactucæ recentis.*

"Take any quantity of the leaves and stalks of the lettuce, when the plant is nearly ready to flower. Bruise them well, and including them in a hempen bag, compress them strongly till they yield their juice. Let this juice be evaporated in flat vessels, heated with boiling water. Let the evaporation be continued till the expressed juice be reduced to the consistence of thick honey.

"According to the trials which I have made, twelve pounds of lettuce will yield about eight ounces of inspissated juice.

"*Method of preparing the Tincture of Lettuce leaves; or the tinctura foliorum siccatorum Lactucæ Sativæ.*

"To one ounce of the dried leaves and stalks of the lettuce cut down, add eight ounces of the diluted alcohol of the Edinburgh Pharmacopœia. Let the vessels containing this mixture be kept for a week in a warm place, shaking it frequently. Let the liquor then be strained through paper, and kept for use. About fifty drops may be taken for a dose."

The following additional preparations he afterwards added in another essay.

1. "*Solutio succi spissati lactucæ.*—Prepared from the inspissated juice spontaneously exuding from the plant when wounded.

2. "*Lactucarium.*—An extract prepared by evaporating the above solution or tincture.

3. "*Tinctura lactucarii.*—Prepared by dissolving lactucarium in proof-spirit of wine.

4. "*Succus spissatus lactucæ.*—Prepared by inspissating the expressed juice of the recent plant.

5. "*Tinctura foliorum lactucæ.*—Prepared by extracting the active powers of the lettuce, from the leaves of the dried plant, by warm infusion in proof-spirit."

The following observations on the method of obtaining Lactucarium, or lettuce opium, from the lactuca sativa of Linnæus, the common garden lettuce, by Mr. John Young, Surgeon in Edinburgh, will not be irrelevant; as they come from a gentleman who has largely devoted himself to the subject.

"In collecting lactucarium last year, according to the method recommended by Dr. Duncan, sen. in the Memoirs of the Caledonian Horticultural Society, I found, that it not only occupied much time, but that I was often disappointed of the substance which I expected to obtain, from its being washed off by rain. It occurred to me, that the milky juice of the lettuce might be immediately collected from the plant in great abundance, by absorbing it on cotton soon after it exudes from the plant, and while it yet continues in a liquid state; and by afterwards inspissating it by a moderate heat, communicated from a water or vapour bath.

"I accordingly adopted that method this year, (1816.) I had the ice-lettuce planted in rows; and when the top of the stem was about

a foot above the ground, I then cut off about an inch from the top of each plant. The milky juice immediately began to rise above the wounded surface. I cut off the tops of all the plants before I began to collect. But after the portion which had exuded was removed by the cotton, I found that the milky juice ceased to exude, until I had made another wound. I began to collect, at the end of the border, where I made the first incision, and then cut off a thin cross slice from the stem of each plant, leaving fresh wounds as I went along. These I found covered with milky juice each time when I returned to where I set out. But after going round the plants about five or six times, in the way mentioned, they ceased to give out any more milky juice at that time. But this process may be repeated two or three times in a day.

"In the manner above described, I have collected more of the milky juice in one day, than I did last year in five days, when it was not removed till it had acquired a dry state and black colour. Having mentioned to a friend my mode of collecting the milky juice in its recent state, by means of cotton, he suggested the use of a wet sponge for that purpose. This, I find, answers better than the cotton; the juice being both more completely removed from the plant, and more easily expressed, than from the cotton. The milky juice collected in this way into a tea-cup, or any similar vessel, soon acquires a dark brown colour, like opium obtained from the papaver somniferum, and has all its other sensible qualities. Hence it may justly be distinguished by the title of lettuce-opium, although, perhaps, less confusion would arise, from employing the name which Dr. Duncan has adopted, that of lactucarium.

"From what I have observed respecting this method of collecting the milky juice from the lactuca sativa, it is my opinion, that in the same manner, opium might be procured in this country from the papaver somniferum, equal, if not superior, to any foreign opium. Dr. James Howison, who was for some time employed by the Honourable East India Company to superintend the preparation of opium in Bengal, has published an essay on that subject in the first volume of the Memoirs of the Caledonian Horticultural Society, page 368, which contains many important observations respecting the preparation of opium in Britain. But the method of collecting the milky juice from the plant by means of cotton or a sponge, possesses many advantages which cannot be obtained by the flask which he proposes, or by the knife and cup of the Hindoos: for by their method of collection, a considerable quantity of the milky juice, exuding from the head of the poppy, must be lost. But by preparing opium in Britain, a still greater advantage would accrue. It would be obtained in a perfectly pure state, which is by no means the case with the opium which is brought to us from abroad."

LAURUS NOBILIS. *E. L. Bay Tree. Leaves, Berries, Oil.*

This tree is a native of the south of Europe, but bears the winters of Great Britain perfectly well. Both leaves and berries contain a considerable quantity of essential oil, which renders them aromatic stimulating substances.

The berries are generally brought from the Mediterranean, and are more pungent than the leaves. In Spain and Italy a considerable quantity of oil is obtained by expression from the fresh berries. It has a green colour, and strong aromatic taste and smell. As it, therefore, is not a fixed oil, but a mixture of fixed and essential oil, and as its peculiar properties depend entirely on the presence of the latter, it is incorrectly stated to be a fixed oil by the Edinburgh College. It should rather have been denominated, from the mode of its preparation, an expressed oil.

Medical use.—It is only used as a stimulant.

LAURUS SASSAFRAS. *E. L. D.* SASSAFRAS. *A.*

Sassafras. Bark of the Root. The Root and Wood. Essential Oil.

This tree is a native of North America, and is cultivated in Jamaica. It is the root which is commonly employed. It is brought to us in long branched pieces. It is soft, light, and of a spongy texture; of a rusty white colour; of a strong pleasant smell, resembling that of fennel; and a sweetish, aromatic, sub-acrid taste. The bark is rough, of a brown ash colour on the outside, and ferruginous colour within; spongy and divisible into layers, and of a stronger taste and smell than the wood.

Neumann got from 480 grains, 80 of alcoholic, and afterwards 60 of watery extract, and inversely 120 watery and 7.5 alcoholic. In distillation the alcohol elevates nothing, but water a ponderous essential oil, in the proportion of about 10 from 480.

Medical use.—Sassafras, from the quantity of volatile oil it contains, is a gently stimulating, heating, sudorific, and diuretic remedy.

It is best given in infusion. The decoction and extract are mere bitters, as the oil is dissipated by the preparation.

The essential oil may be obtained separate by distillation. It is of a whitish yellow colour, and sinks in water. It is highly stimulating and heating, and must be given only in very small doses.

The bark is useful in intermittents; and the oil is said to be efficacious applied externally to wens.*—It forms a very delightful addition to the volatile tincture of guaiacum, and gives a pleasant flavour to pills.

* Barton's Collections, Part I. p. 19. 49.

LAVANDULA. *A.* Lavandula Spica. *E. L. D.*

Lavender. The Flowers.

Lavender is a well-known small, shrubby, perennial plant, a native of the south of Europe, but frequently cultivated in our gardens for the sake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable smell, and a warm, pungent, bitterish taste; the broad-leaved sort is the strongest in both respects, and yields in distillation thrice as much essential oil as the other; its oil is also hotter and specifically heavier; hence, in the southern parts of France, where both kinds grow wild, this only is used for the distillation of what is called oil of spike. The narrow-leaved is the sort commonly met with in our gardens.

Medical use.—Lavender is a warm stimulating aromatic. It is principally used as a perfume.

LEONTODON TARAXACUM. *E. L. D.*

Common Dandelion. Root and Leaves.

This perennial plant is very common in grass fields and uncultivated places. The whole plant contains a bitter milky juice, which, however, is most abundant in the roots before the flower-stem shoots. The bitterness is destroyed by drying, and therefore the recent roots only should be used.

Medical use.—Its vulgar name in all languages shows a popular belief of its possessing diuretic properties; and it was lately a very fashionable remedy in Germany, and given in the form of an expressed juice or decoction, or extract prepared from either of them; but it seems to be merely a mucilaginous bitter.

LICHEN. *A.* *Iceland Moss. The Plant.*

Lichen Islandicus. *L. E. D.*

Iceland Moss. Eryngo-leaved Liverwort.

This is a perennial lichen, very common in Iceland, but also found in the forests and dry sterile woods of Switzerland and Germany, growing upon stones and on the earth. It has dry coriaceous leaves, divided into lobes and laciniæ, which are again notched and subdivided with elevated margins, beset with short, very minute, rigid, parallel hairs, and marked with white spots, reddish towards the points. Amongst the leaves are found peltated, somewhat excava-

ted, shining, viscid bodies, internally of a brown colour: these are the pericarpiums. When fresh, the colour of this lichen is greenish yellow, or greyish brown; but, when dried, greenish white, or grey. In Sweden principally, and in Germany, a variety is found, with smaller, tenderer, crisper leaves, destitute of hairs on the margin, of a paler lead colour, orange beneath. It is gathered in rainy weather, because it is then more easily detached from the stones. In the countries where it abounds, it is used for the nourishment both of cattle and of man. Mr. Proust has analyzed it with much success. A pound of dry lichen, immersed in cold water, soon resumed its fresh colour, and weighed two pounds two ounces, gave out a pale fawn colour, but none of its bitterness. When previously powdered, it gives out a bitter, pale, yellow juice, losing about three per cent. in cold, and six in boiling water. This bitterness resides in an extractive, which is employed in Iceland to dye a brown colour. By boiling lichen a quarter of an hour, it becomes sufficiently tender for use as an esculent vegetable. Lichen cooked in this manner, has a kind of membranous elasticity, peculiar to some of the algæ and fungi; and, after being dried, has only to be moistened with boiling water to resume this elasticity. Its appearance is not very prepossessing, having an unequal yellow colour, and a slight marine smell. A pound of dry lichen, by boiling, weighs three pounds, and when dried again is reduced to two-thirds of a pound.

The decoction has a clear yellow colour, and a slightly bitter taste, which, even when made with eight waters, on cooling becomes a tremulous jelly, without any viscidity. This jelly, on standing, contracts, expresses the water, cracks, and dries into transparent angular fragments of a deep red colour, insoluble in cold water, soluble in boiling water, from which it is precipitated by infusion of galls. By nitric acid it is converted into oxalic acid. The insoluble part dissolves readily in nitric acid, forming oxalat of lime and oxalic acid, and is converted into a gelatinous pulp by potass.

According to this analysis, one hundred parts of dried lichen give of

Bitter extractive,	3
Matter soluble in hot water,	33
Matter insoluble in hot water,	64=100.

The last substance has much analogy with gluten, and the second with starch, particularly in the remarkable property of being precipitated by infusion of galls. It differs from it, however, in not being glutinous, and in the solid matter of the jelly contracting and separating from the fluid, as curd does from whey.

Medical use.—From the analysis of this lichen, it appears to consist principally of a nutritious substance, combined with a bitter; and on the combination of these, its medical virtues probably depend. It is used, according to Arnemann,

1. In cough with expectoration, threatening to terminate in consumption; after neglected catarrhs, the consequence of peripneumony, when the expectoration becomes more copious and purulent.

2. In emaciation from measles, (Schoenheide); from wounds and ulcers with great discharge, (Plenck); after salivation; and from actual ulcers in the lungs, when there is no fever, (Scopoli); especially after neglected colds, or from translated morbid matter. In a high degree of the disease it does little good, but the night sweats are diminished by it, (Millin). In pituitous phthisis it is of great service.
3. In hæmoptysis, (Frize).
4. In chincough, (Tode).
5. In diabetes, as a tonic and palliative remedy.

It is commonly exhibited in decoction with water, broth, or milk, after the bitter has been extracted from it by steeping it in warm water; or, in substance, boiled in chocolate or cocoa, or made into a jelly with boiling water. Half an ounce, or an ounce, must be used daily, and continued for some time. Proust disbelieves its specific virtues, but recommends it strongly as an article of diet in times of scarcity, and as a very convenient anti-scorbutic vegetable in long sea voyages.

Lichen Rocella. *D.* *Litmus.* *Turnsole.*

This lichen is found in Guernsey and Portland island, but it is from the Canary islands that it is chiefly obtained. It is not sold in the state of the plant merely dried, but manufactured by the Dutch into a paste, called *Litmus, Orseille en pate.* It is sold in square masses, about an inch in length, and half an inch in breadth and thickness, hard and brittle, having the appearance of a violet-coloured earth, with white spots. It has a violet smell, probably from the addition of oris root powder; and, when tasted, speedily tinges the saliva, and gives a sense of heat in the mouth. This paste is prepared by making the lichen undergo a kind of fermentation in vats with urine and lime-water, forming the whole into a pulp, and then dividing it into squares to dry.

Litmus is chiefly used as a dye-stuff, and by chemists as a very valuable test of the presence of uncombined acids. I must confess my ignorance of the grounds upon which the Dublin College have introduced it into their *Materia Medica.* The translator of the Pharmacopœia merely says, "It has been used medicinally with an intention of allaying the tickling attendant on phthisis, and in hysterical coughs."

LIMUM USITATISSIMUM. *E. L. D.* LINUM. *A.*

Flax. The Seed and Oil.

This valuable annual plant, is said to have come originally from those parts of Egypt which are exposed to the inundations of the

Nile. It now grows wild among the fields, in the south of England, and many other parts of Europe, and is cultivated in large quantities, both there and in the United States.

Linseed contains about one fifth of mucilage, and one sixth of fixed oil. The mucilage resides entirely in the skin, and is separated by infusion or decoction. The oil is separated by expression. It is one of the cheapest fixed oils; but is generally rancid and nauseous, and unfit for internal use. The cake which remains after the expression of the oil, contains the farinaceous and mucilaginous part of the seed, and is used in fattening cattle, under the name of Oil-cake.

Linseed is considered as emollient, and demulcent. The entire seeds are only used in cataplasms. The infusion is used as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corrosive sublimate.

Linum Catharticum. *D. L.*

Purging Flax. Mill-mountain. The Herb.

This is an annual plant, found wild on dry meadows and pastures in Britain. Its virtue is expressed in its title: an infusion in water or whey of a handful of the fresh herb, or a drachm of it in substance when dried, is said to purge without inconvenience.

LIRIODENDRON. *A.*

Tulip Tree. Tulip-bearing Poplar. The Bark.

This is closely allied to the magnolias. It is a native and well known tree in the United States, called also American poplar, white wood, and in some parts of New-England improperly called *cypress* tree. It attains to a very large size, rising as high as any forest tree, and makes a noble and beautiful appearance when in flower, about the middle of May. This tree is remarkable for the shape of its leaves, having the middle lobe of the three truncate, or cut transversely at the end. The flowers are large and bell-shaped; calyx of three leaves, six petals to the corolla, marked with green, yellow, and red spots; and many lance-shaped seeds, lying one over another, and forming a sort of cone. The bark of the root has long been employed by medical men in the United States, as a tonic, and when joined with various proportions of *prinos virticillatus*, and *cornus florida*, has afforded a remedy of equal efficacy with Peruvian bark. It is a strong bitter, and considerably aromatic and antiseptic, and has been found particularly beneficial in the last stage of dysentery. The powdered root combined with steel dust is an excellent remedy in relaxation of the stomach. Ac-

cording to Dr. Barton, the bark is used in some parts in gout and rheumatism. A decoction of it is said to be a common remedy in Virginia for botts in horses.

"The Liriodendron tulipifera, tulip or poplar tree, grows throughout the United States of North America. The best time to procure the bark for medicinal purposes, is in the month of February; as the sap at this time being more confined to the root increases its virtue. It possesses the qualities of an aromatic, a bitter, and an astringent; the bitter quality is greater, the astringent less than in the Peruvian bark. It likewise possesses an aromatic acrimony; hence, I infer, it is highly antiseptic and powerfully tonic. I have prescribed the poplar bark in a variety of cases of the intermittent fever; and can declare from experience, it is equally efficacious with the Peruvian bark, if properly administered. In the phthisis pulmonalis attended with hectic fever, night sweats, and diarrhœa, when combined with laudanum, it has frequently abated these alarming and troublesome symptoms. I effectually cured a Mr. Kiser, fifty years of age, who was afflicted with a catarrh and dyspeptic symptoms for five years, which baffled the attempts of many physicians, and the most celebrated remedies, by persevering in the use of the poplar bark for two weeks.

"I can assert from experience there is not in all the materia medica, a more certain, speedy and effectual remedy in the hysteria, than the poplar bark combined with a small quantity of laudanum. I have used no remedy in the cholera infantum but the poplar, after cleansing the primæ viæ, for these two years. It appears to be an excellent vermifuge. I have never known it fail in a single case of worms which has come under my observation. I prescribed it to a child when convulsions had taken place. After taking a few doses, several hundreds of dead ascarides were discharged with the stools. The dose of the powder to an adult, is from a scruple to two drachms; it may likewise be used in tincture, infusion, or decoction; but its virtues are always greatest when given in substance."

The foregoing is part of a letter addressed to Governor Clayton of Delaware, in 1792, by Dr. J. T. Young, of Philadelphia. (American Museum, Vol. 12.) In his reply, the governor ohserves, "During the late war the Peruvian bark was very scarce and dear. I was at the time engaged in considerable practice, and was under the necessity of seeking a substitute for the Peruvian bark. I conceived that the poplar had more aromatic and bitter than the Peruvian, and less astringency. To correct and amend those qualities I added to it nearly an equal quantity of the bark of the root of *dogwood* (cornus florida or boxwood) and half the quantity of the inside bark of the white oak tree. This remedy I prescribed for several years, in every case in which I conceived the Peruvian bark necessary or proper, with at least equal if not superior success. I used it in every species of intermittent, gangrenes, mortifications, and in short in every case of debility. It remains to determine whether the addi-

tion of those barks to the poplar increases its virtues or not; this can only be done by accurate experiments in practice."

A further account of the analysis and virtues of this medicine is given by Professor Rush in the transactions of the College of Physicians of Philadelphia, and in a paper published in one of the volumes of Tilloch's Philadelphia Magazine.

LOBELIA. *A.* Lobelia Inflata. *Indian Tobacco. The Herb.*

The lobelia inflata is indigenous, and annual, rising to one or two feet, with branched stems. The leaves are oblong, alternate; slightly serrated and sessile. The blossoms are solitary, in a kind of spike, of a pale blue colour. It is found common in dry fields, among barley and rye stubble, and flowers in July and August; its capsules are inflated, and filled with numerous small seeds.

The leaves chewed are at first insipid, says Dr. Cutler, but soon become pungent, occasioning a copious discharge of saliva. If they are held in the mouth for some time they produce giddiness and pain in the head, with a trembling agitation of the whole body; at length they bring on extreme nausea and vomiting. The taste resembles that of tartar emetic. A plant possessed of such active properties, notwithstanding the violent effects from chewing the leaves, may possibly become a valuable medicine.

It was employed by the aborigines as an emetic, and also by those empirics who affect to deal in Indian remedies only. As a new article it has lately excited much speculation in the New-England States, and its properties have very frequently been subjected to the test of practical experiment. It is found to operate as a speedy and active emetic, and it often induces a most profuse perspiration immediately after being received into the stomach. It has proved serviceable in cases of colic, where emetics were indicated. In a variety of instances it has been administered as a remedy in asthmatic affections, and on competent authority we are assured, that it has in general manifested considerable efficacy, and sometimes proved more beneficial in this distressing disease than any other medicine. From some of its effects, says an eminent physician, lobelia seems to be related to the narcotic plants; to the mouth and first passages it proves acrid and highly stimulant; its stimulus appears to be of the diffusive kind, as Dr. Cutler, on taking it, experienced an irritation of the skin over the whole body. It is probably one of the most powerful vegetable substances with which we are acquainted, and no rational practitioner will have recourse to it, but with the greatest precaution. The melancholy consequences resulting from the use of *lobelia inflata*, as lately administered by the adventurous hands of a noted empiric, have justly excited considerable interest, and furnished alarming examples of its deleterious pro-

perties and fatal effects. The dose in which he is said usually to prescribe it, and frequently with impunity, is a common tea-spoonful of the powdered seeds or leaves, and often repeated. If the medicine does not puke or evacuate powerfully, it frequently destroys the patient, and sometimes in five or six hours.

Even horses and cattle have been supposed to be killed by eating it accidentally. The specific qualities of this highly active plant, promising to be of utility as a remedy, should be particularly investigated by ingenious and intelligent men, that its rank in the Materia Medica may be clearly ascertained.

The following highly interesting observations are from the Rev. Dr. M. Cutler.

When I was preparing my botanical paper, says the Doctor, I had given it (the lobelia) only a cursory examination, and having some doubt about its specific characters, I suspected it to be a new species. Accidentally ascertaining its emetic property, I inserted it with the specific name, *emetic weed.* By chewing a small part of it, commonly no more than one or two of the capsules, it proves a gentle emetic. If the quantity be a little increased, it operates as an emetic, and then as a cathartic, its effects being much the same as those of the common emetics and cathartics. It has been my misfortune, the author observes, to be an asthmatic for about ten years. I have made trial of a great variety of the usual remedies with very little benefit. In several paroxysms I had found immediate relief more frequently than from any thing else, from the skunk-cabbage. (*Dracontium fœtidum.* Linn. *Arum Americanum. Catesby.* See that article in this volume.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury, of Marblehead, also an asthmatic, had made use of a tincture of the Indian tobacco, by the advice of a friend, in a severe paroxysm early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which, I think, is important. In a paroxysm, which, perhaps, was as severe as I ever experienced, the difficulty of breathing extreme, and after it had continued for a considerable time, I took a table-spoonful. In three or four minutes my breathing was as free as it ever was, but I felt no nausea at the stomach. In ten minutes I took another spoonful, which occasioned sickness. After ten minutes I took the third, which produced sensible effects upon the coats of the stomach, and a very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. The urinary passage was perceptibly affected by producing a smarting sensation in passing urine, which was probably provoked by stimulus upon the bladder. But all these sensations very soon subsided, and a vigour seemed to be restored to the constitution, which I had not experienced for years. I have not since had a paroxysm, and only a few times some small symptoms of asthma. Besides the violent attacks, I had scarcely passed a night without more or less of it, and often

so as not to be able to lie in bed. Since that time I have enjoyed as good health as, perhaps, before the first attack.

I have given this minute detail of my own case, from an apprehension that this plant, judiciously employed, may approach nearer to a specific in this most distressing complaint, than any other that has been yet discovered. But I am aware much further experiment is necessary to ascertain its real value. Several medical gentlemen have since made use of the tincture in asthmatic cases with much success, but the effects have not been uniformly the same. In all instances of which I have had information, it has produced immediate relief, but the effects have been different in different kinds of asthma. Some patients have been severely puked with only a tea-spoonful, but in all cases some nausea seems to be necessary. The asthma with which I have been afflicted, I conceive to be that kind which Dr. Bree, in his *Practical Inquiries on disordered Res iration,* &c. calls the first species—"a convulsive asthma from pulmonic irritation of effused serum." My constitution has been free, I believe, from any other disorder, than what has been occasioned by an affection of the lungs, anxiety of the præcordia, and straitness of the breast, and other symptoms produced by that affection.

The result of subsequent practical observation has amply confirmed the utility of lobelia inflata in various diseases. In numerous instances of asthma it has procured the most essential relief, though in general its effects were only temporary and palliative. As a pectoral it has been found useful in consumptive and other coughs depending on mucus accumulated in the bronchial vessels, by exciting nausea and expectoration. From its very speedy operation as an emetic, and its stimulating effects on the mouth and fauces, beneficial results might be expected from its use in croup and whooping-cough; and on some trials our expectations have been realized in this respect. It may perhaps be anticipated to supersede seneka as a remedy in the former, and antimonials in the latter affection. More extensive practical knowledge of the properties of this plant, and the various forms and circumstances of its administration, is still, however, a most desirable object.

The leaves should be collected in August, while the plant is in blossom, and carefully dried and preserved for use. From ten to twenty grains of the powdered leaves will in general be found a suitable dose as an emetic for an adult, or it may be repeated in smaller quantities. As a pectoral, it may be given in powder or pills alone, or combined with other remedies, repeated in small doses, till an evident good result is observable. Of the saturated tincture, twenty, forty, or even sixty drops may be safely given children of one or two years old, increasing as occasion may require.

LYTHRUM SALICARIA. *D.*

Purple-spiked Willow-strife. Loose-strife. The Herb.

This perennial plant grows in marshes, &c. in Great Britain. The dried leaves have an herbaceous taste, somewhat astringent, and when moistened soon give out a ropy mucilage. Hence it is difficult to swallow the powder mixed with water. An ounce of the plant yielded to Sagar three drachms of watery, and 24 grains of spirituous extract, and the former was more disagreeably austere and exsiccative.

The decoction of this plant has been long celebrated in Ireland in diarrhœas. In the same disease, it is a popular remedy in Sweden; and De Haen and Stork and others have given it with success in laxity of the intestines from an accumulation of sordes. After premising a purgative, a drachm or more of the powder may be given morning and evening, or three times a day. A decoction also of the plant or root may be given in diarrhœa or dysentery. Its properties are evidently mucilaginous and astringent.

M.

MAGNESIA.—*MAGNESIA.*

Magnesium, the base of magnesia, only obtained as a dark grey metallic film; less fusible than plate glass, burning with a red light when strongly heated, and decomposing water slowly.

Magnesia is obtained in light, white, friable masses, or very fine powder; to the touch it is very fine; its taste is not very sensible, but peculiar and pleasant; its specific gravity is 2.33. It is insoluble in water, but forms with it a paste without ductility. It is apyrous; slightly alters vegetable blues to green; forms soluble compounds with most acids, and unites with sulphur. The fossils in which it predominates are generally soft, and have an unctuous feel. The principal are talc, steatites, asbestus, &c.

Hydrat of magnesia is the state in which it is obtained by precipitation, from its solution in an acid, by potass or soda.

MAGNESIA (Usta. *D.*) *A. E. L.* *Magnesia. Calcined Magnesia.*

Take of

Carbonat of magnesia, any quantity.

Heat it to redness in a crucible, and keep it in this state for two hours. Then inclose it in close-stopped glass bottles.

Its specific gravity is 2.33, and when sprinkled with water, heat is produced, and it absorbs 18 *per cent.* Magnesia decomposes alum, borax, tartrat and succinat of ammonia, tartrat of potash, tartrat of potash and soda, and all the officinal metallic salts.

Medical use.—It is used for the same general purposes as the carbonat. In certain affections of the stomach, accompanied with much flatulence, magnesia is preferable, both because it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the stomach, without any extrication of gas, which is often a troublesome consequence when carbonat of magnesia is employed in these complaints.

MAGNESIÆ CARBONAS. *A. E. L.* MAGNESIA. *D.*

Magnesia. Carbonat of Magnesia.

Take of
- Sulphat of magnesia, ... four parts;
- Carbonat of potass, ... three parts.

Dissolve them separately in double their quantity of warm water, and let the liquors be strained or otherwise freed from their feces: then mix them, and instantly add eight times their quantity of warm water. Let the liquors boil for a little on the fire, stirring it at the same time; then let it rest till the heat be somewhat diminished; after which strain it through linen: the carbonat of magnesia will remain upon the cloth, and it is to be washed with pure water till it become altogether void of saline taste. *E.*

In this process there is a mutual decomposition of the two salts employed. The potass unites itself to the sulphuric acid, while the carbonic acid combines with the magnesia. The large quantity of water used is necessary for the solution of the sulphat of potass formed; and the boiling is indispensably requisite for the expulsion of a portion of the carbonic acid, which retains a part of the magnesia in solution. One hundred parts of crystallized carbonat of potass are sufficient for the decomposition of 125 parts of sulphat of magnesia; and from these quantities about 45 parts of carbonat of magnesia are obtained.

The ablutions should be made with very pure water; for nicer purposes distilled water may be used, and soft water is in every case necessary. Hard water for this process is peculiarly inadmissible, as the principle in waters, giving the property called *hardness*, is generally a salt of lime, which decomposes the carbonat of magnesia, by compound affinity, giving rise to carbonat of lime, while the magnesia unites itself to the acid of the calcareous salt, by which the quantity of the carbonat is not only lessened, but is rendered impure by the admixture of carbonat of lime. Another source of impurity is the silica which the sub-carbonat of potass ge-

nerally contains. It is most easily got rid of by exposing the alkaline solution to the air for several days before it is used. In proportion as it becomes saturated with carbonic acid, the silica is precipitated, and may be separated by filtration.

The carbonat of magnesia thus prepared is a very light, white, opaque substance, without smell or taste, effervescing with acids. It is not, however, saturated with carbonic acid. By decomposing sulphat of magnesia by an alkaline carbonat, without the application of heat, carbonat of magnesia is gradually deposited in transparent, brilliant, hexagonal crystals, terminated by an oblique hexagonal plane, and soluble in about 480 times its weight of water. The crystallized carbonat of magnesia consists of 50 acid, 25 magnesia, and 25 water; the sub-carbonat consists of 48 acid, 40 magnesia, and 12 water; and the carbonat of commerce of 34 acid, 45 magnesia, and 21 water. It is decomposed by all the acids, potass, soda, baryta, lime, and strontia, the sulphat, phosphat, nitrat, and muriat of alumina, and the super-phosphat of lime.

A solution of super-carbonat of magnesia, prepared in imitation of the super-carbonat of soda, has been lately introduced into commerce by Mr. Murray, a surgeon of Belfast, which answers very well the purposes for which it is adapted.

Medical use.—Carbonat of magnesia is principally given to correct acidity of the stomach, and in these cases to act as a purgative; for solutions of magnesia in all acids are bitter and purgative; while those of the other earths are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges nor produces any sensible effect: a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas the common absorbents, in the same circumstances, instead of loosening, bind the belly. When the carbonat of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonic acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonat; but on other occasions good effects arise from the action of the gas evolved, as in nausea and vomiting. It has of late been recommended highly, in small doses, in calculous cases.

It affords great satisfaction to announce that the manufacture of this article on an extensive scale has been commenced by Mr. William Dunn, apothecary and chemist of Boston. His apparatus is connected with an extensive salt-work. He calculates to make thirty thousand pounds a year, sufficient to supply the United States and any other demand which may be made. From each gallon of bittern about five or six ounces of magnesia is obtained. When first formed it is very pure, but by exposure to the air it attracts carbonic acid; and has then all the appearance of the carbonat of magnesia of the shops. Some specimens of it have been examined, and pronounced equally as pure as that imported. Connected with the

apparatus, kettles are prepared for burning the carbonat to form the pure magnesian earth.

Dr. Thomson found six per cent. of gypsum in a specimen of this salt, and others have also detected this adulteration. *Gypsum* may be detected, by boiling a sample in distilled water, and assaying the solution by a barytic or oxalic test. *Chalk*, by adding dilute sulphuric acid to the suspected portion; if any be present, the solution will be loaded with a white and insoluble precipitate.

The *incompatible substances* with carbonat of magnesia, are acids and acidulous salts, alkalies and neutral salts, alum, cream of tartar, nitrat of quicksilver, acetat of mercury, corrosive sublimate, superacetat of lead, sulphats of zinc, iron and copper.

MAGNESIÆ SULPHAS. *A. E. L. D.*

Sulphat of Magnesia. Epsom Salt. Bitter Purging Salt.

This salt is found abundantly in some caves of Tennessee. It is also contained in several mineral springs, and also in sea water, from which it is obtained by evaporation. It crystallizes in tetrahedral prisms. It has a very bitter taste. It is soluble in its own weight of water at 60°, and three-fourths of its weight of boiling water. Sulphat of magnesia when perfectly pure, effloresces, but that of commerce generally contains foreign salts, such as the muriat of magnesia, which renders it so deliquescent that it must be kept in a close vessel or bladder. By the action of heat it undergoes the watery fusion, and loses its water of crystallization, but does not part with its acid. It is decomposed by baryta, strontia, the alkalies, and all the salts formed by these salifiable bases, excepting the alkaline muriats; and by the nitrat, muriat, and carbonat of lime.

Medical use.—It is a mild and gentle purgative, operating with sufficient efficacy, and in general with ease and safety, rarely occasioning any gripes, sickness, or the other inconveniences which purgatives of the resinous kind are too often accompanied with. Six or eight drachms may be dissolved for a dose in a proper quantity of common water; or four, five, or more, in a pint, or quart of the purging mineral waters. These liquors may likewise be so managed as to promote evacuation by the other emunctories; if the patient be kept warm, they increase perspiration; and by moderate exercise in the cool air, the urinary discharge. Some allege this salt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

It is principally used for the preparation of the carbonat of magnesia.

MAGNOLIA GLAUCA. *A.* (*Secondary.*)

Small Magnolia. The Bark; also the bark of the M. Acuminata and M. Tripetala.

The M. glauca, in Massachusetts, is called simply *magnolia;* in the middle states, *swamp sassafras* and *beaver tree;* in the southern states, *sweet bay* and *white bay.*

The bark has a bitter taste, combined with an aromatic pungency approaching that of *sassafras* and *calamus.* This aroma resides in a volatile portion, which is lost when the bark is kept for some time. It affords a little resin and a bitter extractive substance.

As a medicine, it is an aromatic tonic. approaching to cascarilla, canella, &c. It possesses the properties of a warm stimulant and diaphoretic, and has been useful in chronic rheumatism, in the form of tincture. It has also been used in the cure of intermittent and remittent fevers, as well as in the fevers of a typhoid type.

Upon the whole, it will probably not be deemed necessary to remove it from the class of secondary remedies.

MALVA SYLVESTRIS. *E. L.*

Common Mallow. Leaves and Flowers.

The whole plant abounds with mucilage. The leaves were formerly of some esteem, in food, for loosening the belly; at present, decoctions of them are sometimes employed in dysenteries, heat, and sharpness of urine, and in general for obtunding acrimonious humours; their principal use is in emollient clysters, cataplasms, and fomentations.

MANGANESIUM. *Manganese.*

Small whitish grey globules; specific gravity 6.850; very hard and very brittle; very difficult of fusion; very oxydizable by exposure to air; decomposes water rapidly; is oxydized by the sulphuric and nitric acids; burns when strongly heated in oxygen or chlorine; combines with many metals. According to Berzelius, it forms five oxyds, containing, 1, 2, 4, 6, and 8 proportions of oxygen, to one of metal. These oxyds colour glass brown, violet, or red, and destroy the colour of glass coloured by iron.

Manganese is found,

I. Metallic.

1. Native manganese (Perouse.)

II. Oxydized. Grey ore, containing its black oxyd.
1. Foliated grey ore.
2. Radiated.
3. Compact.
4. Earthy.
III. Sulphureted. The black ore.
IV. Carbonated. The red ore.

MANGANESIUM. *D.* *Black Oxyd of Manganese.*

This metallic oxyd is now, for the first time, introduced into the Materia Medica. It is to be regretted that the Dublin College has given as the officinal name of the oxyd, that which scientifically belongs to the metal.

The varieties of the grey ore are the most common. It is found in its greatest purity at Exeter, and at Howth near Dublin. It is chiefly used for destroying the colour which iron imparts to glass, and has hence been called glass-maker's soap, and for preparing the oxymuriatic acid, now so much used in bleaching. The recent application of the same acid to the destruction of contagion, and to other medical purposes, has procured the black oxyd of manganese a place in the list of the Materia Medica.

One ounce and an half of this oxyd added to the cask of water, is said to preserve it at sea. *Annals of Philos. Dec.* 1819.

MANNA. *A. L. D. E.*

Manna. The concrete juice of the Fraxinus Ornus, or Manna Ash.

Manna is obtained from other species of fraxinus besides the ornus, and especially from the rotundifolia. It is principally collected in Calabria, Apulia and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, which, when naturally concreted on the plants and scraped off, is called manna in the tear; but if allowed to exude on straws, or chips of wood fastened to the tree, it is called canulated or flaky manna. The common, or fat manna, is got by incisions made after the spontaneous exudation is over, and is in larger masses and of a redder colour. The best Calabrian manna is in oblong, light, friable pieces or flakes, of a whitish or pale yellow colour, and somewhat transparent. The inferior kinds are moist, unctuous, and dark coloured.

Denon, in his travels in Sicily, has given an account of the manna produced there, which, though less known, is dearer than that of Calabria, and preferred to it. As soon as the trees are seven or eight years old, and about eight feet high, horizontal incisions are begun to be made in the bark one over the other, from the surface of the

earth to the top of the tree. The operation is repeated every two days, from the 15th July, until the rains or fogs of autumn suspend the circulation or deteriorate the quality of the saccharine juice which exudes. The liquor first appears like a white froth extremely light, pleasing to the palate, and of a very agreeable flavour. The heat of the sun coagulates this frothy juice, and gives it the form of stalactites. The glutinous and more highly coloured liquor that now distils from the wounds, is received on leaves of the Indian fig, placed for the purpose at the foot of the tree. This too becomes at length congealed by the sun, and being then taken up in lumps, forms what is called *fat manna*, which is heavier, more purgative, and of much less value.

The wood of the manna-ash is hard, heavy, and bitter, and the decoction of it is said to be aperient, and of great efficacy in the dropsy.

Olivier mentions different kinds of manna found in Persia, one called *Cherker*, more purgative than Calabrian manna, got from the North of Khorassan and Little Tartary; another very good to eat, which must be collected before sunrise, because it melts with the heat of the sun; and a third, called *Therenjabri*, the product of the *Hedysarum alagi*, in the warmest provinces of Persia and Arabia. It is gathered during a month at the end of summer. It is found in all parts of the plant, especially the young shoots, in little round grains, which have the taste and consistence of well-crystallized sugar, and like it crackle under the teeth. It is very common, and found in all the druggists' shops of Persia, but commonly mixed with leaves and other impurities. It is not more purgative than honey, but is much used as a pectoral.

Manna appears often to be formed and deposited by insects. Manna is said to be sometimes counterfeited by a composition of sugar and honey, mixed with a little scammony: there is also a factitious manna, which is white and dry, said to be composed of sugar, manna, and some purgative ingredient, boiled to a proper consistence. This may be distinguished by its weight, solidity, and transparent whiteness, and by its taste, which is different from that of manna.

According to Neumann, manna dissolves in alcohol. On setting the solution in a digesting heat, it gradually deposites 5-8ths of the manna, of a fine white colour, light, spongy, and in some degree crystalline, melting instantly upon the tongue, and impressing an agreeable sweet taste, without any of the nauseousness of the manna. By further evaporation 1-4th more is obtained, similar to manna; and on continuing the evaporation, a thick extract is formed, of the consistence of a balsam, which can scarcely be fully exsiccated, but continues moist, and resembles civet grown brown by age. This extract, which is about 1-8th, contains all the nauseous matter of the manna. The experiments which Dr. Duncan has made verify these observations. The quantity of matter which a hot alcoholic solution of manna deposites on cooling is various: a saturated solution concretes into a perfectly dry, white, spongy, crystallized mass. When

much less concentrated, it deposites a congeries of most beautiful snow white acicular crystals. A saturated solution in boiling water also forms a solid crystallized mass on cooling. Fourcroy says, that when a solution of manna is clarified with whites of eggs, and sufficiently concentrated, crystals of sugar may be obtained from it. But with Dr. Thomson the experiment did not succeed: its crystals were always acicular, and more difficultly formed.

Medical use.—Manna is a mild agreeable laxative, and may be given with safety to children and pregnant women: nevertheless, in some particular constitutions, it acts very unpleasantly, producing flatulency, and distention of the viscera: these inconveniences may be prevented by the addition of any grateful warm aromatic. Manna operates so weakly as not to produce the full effect of a cathartic, unless taken in large doses; and hence it is rarely given by itself with this intention. It may be commodiously dissolved in the purging mineral waters, or joined with the cathartic salts, senna, rhubarb, or the like.

MARANTA. *A.* Maranta Arundinacea.

Arrow Root. Fecula of the Root.

This plant is a native of Jamaica and other West India islands, and of the continent of South America. By a letter from Mr. E. L. M'Call, to Dr. Barton, (Philadelphia Medical and Physical Journal, vol. II.) it appears that the soil of the southern sea-coast is well adapted to it; and, he adds, that Campbell Wylly, Esq. of Sapelo Island, in Georgia, asserted, "that a spot of land on his plantation, not remarkable for its fertility, yielded arrow-root sago in the proportion of 1480 lbs. to the acre." The extensive use of this article in the United States, in the diseases of the bowels, &c. &c. renders this information of great importance.

This plant was originally the production of the East Indies, and is now cultivated in Jamaica, and other West India islands, and in South America. Arrow root agrees with sago, salep, and tapioca in its general nutritious property, but is reckoned to excel them, so far as to afford a much larger proportion of mucilage than any vegetable hitherto discovered. Hence it is of superior utility as an article of diet for the sick and invalids, and particularly in cases of acrimony, either in the general habit, as in hectic fever or consumption; or in particular secretions, as in affections of the urinary passages, namely, inflammation, stone, or gravel; and also in affections of the bowels, as in looseness and dysentery. It furnishes also an excellent remedy for the bowel complaints, which so commonly prevail in the United States during the warm season, especially among children. The jelly is made by adding to a table-spoonful of the powdered root as much cold water as will make it into a soft paste,

then pour on boiling water, stirring it at the same time briskly, until it become a clear jelly, which may be seasoned with sugar and nutmeg, or a little wine or lemon juice may be added. For children it may be prepared with milk, and if it ferment on the stomach, the addition of a little animal jelly will obviate that effect. Prepared in the form of pudding, the arrow root powder is far preferable to any of the farinaceous substances; and affords a delicate and very proper food for convalescent patients. According to Dr. Wright, of Jamaica, a decoction of the fresh root makes an excellent ptisan in acute diseases. In a pamphlet published in 1796, by Mr. T. Rider, we find the culture of this valuable article highly recommended to the West Indian planters, and the new African colonists, as an object of commerce, and the most eligible substitute for starch made of wheat. By the author's computation eight millions of pounds weight of starch are made annually in Great Britain alone from that valuable grain. It appears also by the same authority that arrow root starch is of the finest quality, and that one pound of it is equal to two pounds and a half of that prepared from wheat. Fortunately the arrow root has of late years been introduced into the states of South Carolina and Georgia, and by practical experiment it is ascertained that the soil of the southern sea coast is well adapted to it. John Cooper, Esq. an opulent planter on St. Simon's, and Campbell Wylly, Esq. of Sapelo Island, have, it is understood, so far succeeded in their attempts, as to afford the most flattering encouragement, that this important article may be added to the numerous sources of wealth enjoyed by our southern planters. No production, it is presumed, can promise a more ample remuneration, to stimulate the planter to attempt its cultivation; and when it is considered, that, in proportion to the produce, the demand will be extended, its claim as a rival staple with rice and cotton may, perhaps, be anticipated.

MARRUBIUM (Vulgare. *E. L. D.*) *A.* (*Secondary.*)

(*White*) *Horehound. The Herb, the Leaves.*

This is a perennial plant, which grows wild on road sides, and among rubbish. The leaves have a very strong, not disagreeable smell, and a roughish, very bitter taste. Neumann got from 480 grains, 270 watery, and 30 alcoholic extract, and inversely 150 alcoholic, and 140 watery. They promote the fluid secretions in general, and liberally taken, loosen the belly.

MEL. *A. E. L. D.—HONEY.*

This is a well known substance, and although it is most probably of vegetable origin, we do not procure it in any quantity except as an animal excretion, from the bee, (apis mellifica). This industrious insect, in the summer time, flies from flower to flower to collect the sweet juice secreted in them. When sufficiently loaded, it returns to its hive, where it deposits it, as a winter's supply, in the cells of the comb it had prepared of wax to receive it. What change it undergoes in the body of the insect is unknown; but it is certain that honey varies very much, according to the nature of the plants from which it is collected. In some situations, where poisonous plants abound, it is even deleterious.

The best honey is that which is freest from colour, and contains the largest grains when it concretes. For medical use, it should also be as free of flavour as possible. That obtained from young bees, and which flows spontaneously from the combs, is the purest and finest, and is known by the name of virgin honey. When separated from the wax by expression, it is less pure; and there is another sort still inferior, obtained by heating the combs before they are put into the press.

Honey consists principally of sugar, but it also probably contains mucilage and an acid, and is often impregnated with the essential oil of the flowers from which the bees have gathered it, as in the perfumed honey of the Crimea. In some parts of Asia and America, poisonous honey is met with, from the bees feeding on poisonous flowers. Neumann exsiccated honey in the water bath; the vapour which arose, he says, took fire on the approach of a candle, and diffused its smell widely, and the liquor which was condensed was manifestly impregnated, both with the smell and taste of honey, and amounted to three ounces upon eight of honey. Dissolved in water, it undergoes the vinous fermentation, forming mead. Treated with alcohol, Proust says it may be separated into two kinds, one liquid, and the other crystalline. Cavellazzi obtained crystals of sugar from it, by saturating its acid with carbonat of lime; and it is converted into oxalic acid by the action of nitric acid.

Medical use.—From the earliest ages it has been employed as a medicine. Besides the general properties of saccharine bodies, it possesses others peculiar to itself, probably depending on the presence of an acid. For internal use, sugar is always to be preferred, as honey, in some constitutions, produces gripes and colic pains. From its stimulus, however, it forms an excellent gargle, and facilitates the expectoration of viscid phlegm, and is sometimes employed as an emollient application to abscesses, and as a detergent to ulcers.

MEL DESPUMATUM. *A. E. L. D.* *Clarified Honey.*

Melt the honey in a water bath, and remove the scum as it rises.

In this simple process, the honey is rendered so liquid by the heat of the boiling water, that the wax, and other lighter impurities, which it commonly contains, rise to the surface in the form of a scum, which is easily removed. At the same time, sand, or any heavier mixture of that kind, sinks to the bottom.

Honey was supposed to be peculiarly balsamic, and was therefore at one time much used in pharmacy. But as its saccharine matter is absolutely of the same nature with that of sugar, and as the extraneous matters which it always contains, make it disagree with the stomachs of many individuals, the number of medicated honeys has been much diminished, and their place in some instances supplied by syrups. Medicated honeys are known to be of a proper consistence, by allowing a small quantity to cool on a plate, if when divided by the edge of a spoon, the portions do not immediately unite, or if the specific gravity when hot, be 1.26, or 1.31, when cold.

MELLITA. *A.—PREPARED HONEYS.* *MEDICATED HONEYS.*

Oxymel. *D. E.* Oxymel Simplex. *L.* *Oxymel. Simple Oxymel.*

Take of
Honey, ... two pounds;
Distilled vinegar, ... one pound by weight.
Boil in a glass vessel with a gentle fire to the consistency of a syrup, skimming it.

This was once in great repute as a cooling and attenuating medicine; it is scarcely used in modern practice, except in colds attended with coughs, and in sore throats, for which, when diluted with some aromatic or astringent infusion, as sage tea, rose-flower tea, &c. it makes useful gargles.

Mel Boracis. *L.* Mel Sub-boratis Sodæ. *E.*

Honey of Borax.

Take of
Sub-borat of soda, powdered, . . . one drachm;
Clarified honey, ... one ounce.
Mix them.

This is an useful formula, much employed as a detergent in aphthæ and ulcers of the mouth.

OXYMEL COLCHICI. *D.* *Oxymel of Meadow Saffron.*

Take of
The fresh root of meadow saffron, cut into thin slices, one ounce;
Distilled vinegar, ... one pint;
Clarified honey, ... two pounds.

Macerate the root of meadow saffron, with the vinegar, in a glass vessel, with a gentle heat, for forty-eight hours. Strain the liquor, pressed out strongly from the root, and add the honey. Lastly, boil the mixture, frequently stirring it with a wooden spoon, to the thickness of a syrup.

This is an active preparation, but its use may be entirely superseded by the syrup of the same root.

MEL ROSÆ. *D. L.* (GALLICÆ. *E.*) *Honey of (Red) Roses.*

Take of
Dried red-rose petals, ... four ounces;
Boiling water, ... three pints;
Clarified honey, ... five pounds.

Macerate the rose leaves in the water for six hours; then mix the honey with the strained liquor, and boil the mixture to the thickness of a syrup.

This preparation is not unfrequently used as a mild cooling detergent, particularly in gargarisms for ulcerations and inflammation of the mouth and tonsils. The rose-buds here used should be hastily dried, that they may the better preserve their astringency.

The Dublin College, in making this and other similar preparations, use unclarified honey, with the idea, probably, that it may be equally well clarified in the course of the preparation itself. This is no doubt true, but as we do not know what effect the clarification may have on the active substances added to the honey, we think that the use of clarified honey, as directed by the London College, is preferable.

MEL SCILLÆ ACETATUM. *A.* OXYMEL SCILLÆ. *L. D.*

Acetated Honey of Squill. Oxymel of Squills.

Take of
Clarified honey, . . . three pounds;
Vinegar of squill, . . two pints.

Boil them down, in a glass vessel, to a proper consistence, on a water bath, saturated with muriat of soda.

We do not well perceive the necessity of the water bath, saturated with common salt. To say the least of it, it is unnecessary.

We also object to the name adopted by our Pharmacopœia, as an unnecessary change (from a very old one) and withal incorrect in itself. It cannot be maintained that this is an *acetated honey* of squills, being the product of *acetated squills* combined with honey. If a change was requisite, it should rather have been *Acetum Scillæ Mellitum.*

The dose, one to three drachms; in larger amount it proves emetic.

MEL SCILLÆ COMPOSITUM. *A.*

Compound Honey of Squill.

SYRUPUS SCILLÆ COMPOSITUS.

Compound Syrup of Squill; vulgo, *Hive Syrup.*

As this is an original prescription of my own, adopted by our Pharmacopœia, I shall assume the right to restore it to its pristine form, as the Convention have not amended it, by taking only *half* the amount of ingredients; and I am persuaded from very sufficient experience, that it is better made in proportion to the amount formed at once. This article, as sold in the shops, is not what it ought to be, not being boiled down sufficiently, nor adequately depurated from its feces by standing. When properly made, it is not disgusting to children, but as commonly sold, it is very much so.

It may be questioned whether the name adopted by the Convention, is better than the original one. I think the syrups and honeys should be united in one set, for there is little difference in their effects on the preparation.

Take of
Seneca snake root, bruised,
Squills, dried and bruised, . . . of each half a pound;
Water, ... eight pounds;
Boil together over a slow fire, till the water is half consumed—strain off the liquor, and then add of
Strained honey, ... four pounds.
Boil the honey and the strained liquor to six pounds, or to the consistence of a syrup, and add to every pound of this syrup, sixteen grains of tartar emetic; that is, one grain to the ounce.

The dose varies from ten drops to one or more tea-spoons full, every quarter, half, or one hour, according to the age of the patient, or the violence of the disease.

It operates by purging, vomiting, and sweat.

I here insert the original notice I gave respecting it in the American Medical Museum.

From the misfortune of having all my children, five in number, from their birth, subject to attacks of trachitis or the hives, I found it very necessary to turn my particular attention to that disease. All the common remedies, as syrup of squills, decoctions of seneka, &c.

have been found of little advantage; at length I fell upon the plan of combining the virtues of the remedies most celebrated, into the form of syrup, which I denominated hive syrup. As I have been frequently asked for it, by those who have in their families experienced its efficacy, I have here given the receipt, which will enable every one at a trifling expense to prepare it for themselves as a domestic medicine. It is far superior to every other form of hive syrup I have ever tried, and is equally superior to them in common colds, whooping cough, and those other complaints for which syrup of squills, &c. are so constantly employed. I may add, that as it sometimes ferments in the hot months, all that is necessary, is merely to boil it down a little, which prevents the continuance of the fermentative process, without diminishing the efficacy of the remedy.

Oxymel (Linimentum. *L.*) Æruginis. *D.*

Oxymel or Liniment of Verdigris.

Take of
Prepared verdigris, . . . one ounce;
Vinegar, ... seven ounces;
Clarified honey, ... fourteen ounces.

Dissolve the verdigris in the vinegar, and strain it through linen; then add the honey, and boil the whole to a proper thickness.

This is used only externally for cleansing foul ulcers, and keeping down fungous flesh. It is also often serviceable in venereal ulcerations of the mouth and tonsils: but there is some danger from its application to places from the situation of which it is apt to be swallowed; for even a small quantity of verdigris passing into the stomach may be productive of distressing, if not deleterious effects.

MELALEUCA LEUCADENDRON. *E. D.*

Melaleuca Cajuputi. *L.*

Broad-leaved Cajeput Tree. The essential Oil. Cajeput Oil.

The tree which furnishes the cajeput oil is frequent on the mountains of Amboyna, and the other Molucca islands. Drs. Maton and Smith have lately examined specimens of this tree, which correspond with Rumphius, tab. 17, vol. ii.; and, as an unclassified species, have named it Melaleuca cajuputi. But, as Thunberg says, it is got from the leucadendron, perhaps both species yield it. Indeed, Rumphius himself would lead us to the same opinion. The oil is obtained by distillation from the dried leaves, and is prepared in great quantities, especially in the island of Banda, and sent to Holland in copper flasks. As it comes to us, it is of a green colour, very

limpid, lighter than water, of a strong smell, resembling camphor, and a strong, pungent taste, like that of cardamoms. It burns entirely away, without leaving any residuum. It is often adulterated with other essential oils, coloured with the resin of milfoil. In the genuine oil, the green colour depends on the presence of copper; for, when rectified, it is colourless.

Medical use.—Like other aromatic oils it is highly stimulating, and is principally recommended in hysteria, epilepsy, flatulent colic, and paralysis of the tongue. The dose is from one to four drops on a lump of sugar.

It is applied externally where a warm and peculiar stimulus is requisite; and is employed for restoring vigour after luxations and sprains, and for easing violent pain in gouty and rheumatic cases, in toothach, and similar affections.

MELISSA OFFICINALIS. *E. Balm. The Herb.*

Balm is a perennial plant, which grows wild on the Alps and Pyrenees, and is frequently cultivated in our gardens. It has a pleasant smell, somewhat of the lemon kind; and a weak, roughish, aromatic taste. The young shoots have the strongest flavour; the flowers, and the herb itself when old, or produced in very moist rich soils or rainy seasons, are much weaker both in smell and taste.

It is principally used in the form of a watery infusion, which is drunk in the manner of tea.

MENISPERMUM COCCULUS. *E.*

Cocculus Indicus. The Berry.

This tree is a native of Ceylon, Malabar, Java, and other parts of India. The nuts are about the size of large peas, of a grey colour and wrinkled surface. They contain a kidney shaped seed, within a very thick shell. The seed is intensely bitter, and very acrid. Mr. Boullay analyzed them, and found them to contain about half their weight of a concrete waxy oil, albumen, a particular colouring matter, a new, bitter, poisonous principle, which he has named *picrotoxine*, fibre, and various saline matters. The picrotoxine acts as a poison, resembles camphor in its action, but is much more powerful. The cocculus is used to intoxicate fish, in order that they may be caught; and it is said to be much used by the London porter brewers to give bitterness to their beer, and to render it more intoxicating. An ointment made with it, has long been a domestic remedy

in some places to kill vermin on the head, and is successfully used in cases of tinea capitis.

Boullay's process to obtain picrotoxine was, to boil in water the cocculus indicus divested of its pericarpium; into the filtered solution, acetat of lead is poured, which causes a precipitate; the solution is filtered and evaporated to the consistence of an extract; this is digested with alcohol at 40°, and the resulting liquor is again evaporated These operations are repeated, until a product is obtained, perfectly soluble in water and in alcohol; this product consists of *picrotoxine* and a yellow matter; stirred with a little water, this yellow matter is dissolved, and a great number of small crystals separate, which are to be washed. Thus obtained, the picrotoxine is in brilliant, semi-transparent, white, quadrangular prisms, soluble in alcohol and water, in solutions of the alkalies, in acetic and diluted nitric acids, and in oil.

MENTHA PIPERITA. *A. E. D. L.* *Peppermint.* *The Herb.*

This species of mint is perennial, and a native of Britain, where it is cultivated in very great quantities for the sake of its essential oil. The leaves have a strong, rather agreeable smell, and an intensely pungent, aromatic taste, resembling that of pepper, and accompanied with a peculiar sensation of coldness.

Its predominant constituents are essential oil and camphor, both of which rise in distillation, and are combined with what is called oil of peppermint.

Medical use.—Peppermint is principally used as a carminative and antispasmodic. The distilled water is a domestic remedy for flatulent colic, and the essential oil is often given with advantage in doses of a few drops in cramps of the stomach.

MENTHA VIRIDIS. *A. L. D.* *Spearmint.* *The Herb.*

Spearmint is perennial, and a native of Britain. The leaves have a warm, roughish, somewhat bitterish taste; and a strong, not unpleasant, aromatic smell. Their virtues are stomachic and carminative.

MENTHA PULEGIUM. *E. L. D.* *Penny-royal.* *The Herb.*

This is also perennial, and a native of Britain. In its sensible qualities it is warm, pungent, and aromatic, somewhat similar to spearmint, but less agreeable. It is seldom used.

MENYANTHES TRIFOLIATA. *A.* (*Secondary.*) *E. L. D.*

Buck-bean. Marsh Trefoil. The Root. The Leaves.

This perennial plant is very common in marshy situations, and is one of the most beautiful of the native flowers of Great Britain. It is likewise indigenous in the United States.

The leaves grow by threes on footstalks. They are excessively bitter, and their bitterness is extracted by infusion. They are said to be sometimes used in brewing ale, and that one ounce will go as far as half a pound of hops.

Medical use.—A drachm of them in powder purges and vomits. In infusion or extract they have been recommended in intermittents, in several cachectic and cutaneous diseases. The dose of the extract is from ten to twenty grains.

METALS AND THEIR OXYDS, &c.

Metals are crystallizable; their form depends on the regular tetrahedron or cube; their surface is specular; they are perfectly opaque, even when melted; their colour is various; their lustre peculiar and shining, or splendent; their hardness various, but at least considerable; many of them are brittle, others possess malleability and ductility in a surprising degree, and some are scissile, flexile, or elastic; their fracture in general is hackly; their texture compact, fibrous or foliated; many of them are remarkably sonorous; their specific gravity greater than five;* they possess no smell or taste, unless when heated or rubbed; they are the best conductors of caloric and electricity; are powerful agents in producing the galvanic phenomena, and a few of them are the only substances which exhibit the phenomena of magnetism. By the action of caloric they melt, but with different degrees of facility, and some of them may be vaporized. Except iron and platinum, they melt suddenly, without undergoing any intermediate state of softness; and when melted, their surface is convex and globular. They are insoluble in water, but some of them decompose it, and are oxydized by it.

They are oxydized with different degrees of facility, some by mere exposure to air, and others seem almost to resist the action of heat and air. The oxydability is always increased by increase of temperature. Their oxyds are in the form of powder, laminæ, or friable fragments; sometimes crystalline; of various colours, determinate with regard to each metal; possess greater absolute weight; are refractory, or fusible into glass; insipid, or acrid, and styptic; in general insoluble in water; and combine with either acids and alkalies, or only with acids. Some of those are disoxygenized by light

* Excepting in the cases of the newly discovered metals by Mr. Davy.

alone, others by caloric, and others require hydrogen, carbon, &c.

Most of them are capable of combining with different proportions of oxygen. Dr. Thomson proposes to call the oxyds with a minimum of oxygen protoxyds, and with additional doses deutoxyds, tritoxyds, &c. in succession, and the oxyds with a maximum of oxygen peroxyds.

Chlorine combines with many of the metals, constituting the substances formerly called *muriats,* and metallic butters. With the metal it unites without decomposition, but when an oxyd is exposed to the action of muriatic acid, the hydrogen of the acid, and oxygen of the oxyd combine as water, whilst the metal and chlorine unite together. Some metals combine with chlorine in more proportions than one. Sir H. Davy distinguishes them, by adding to the name of the metal, the termination *ane,* when it is combined with a smaller proportion of chlorine, and *ana* or *anea* when with a greater; as phosphorane, phosphorana, stannane, stannanea, ferrane, ferranea, &c. but the terms of *protochloride* and *perchloride,* used by other chemists, are preferable.

Hydrogen gas is capable of holding arsenic, zinc, iron, tellurium, potassium and boron in solution; and all these gases contain their own bulk of hydrogen gas.

Carbon unites only with iron.

The metallic phosphurets are fusible, brilliant, brittle, granulated, lamellated, scarcely combustible, and permanent.

The sulphurets are brittle; crystallizable in large, brilliant, and metallic laminæ, more easily fusible than the refractory metals, but less easily than the very fusible metals; decomposable by heat, humidity, and the acids.

The iodides of the easily oxydizable metals, as zinc, iron, tin, antimony, decompose water; those of lead, silver and mercury do not. The iodide of mercury has a fine red colour, or yellowish green, according as the iodine or mercury predominates. The former melts, and is sublimed in rhomboidal plates of a golden yellow, which on cooling becomes of a brilliant scarlet.

The mixtures of the metals with each other are termed alloys: those in which mercury is contained are amalgams. They acquire by mixture new properties, and are in general more fusible than their components. The reguline metals are not soluble in the acids; but when acted upon by them, are first oxydized, and then dissolved. The metallic oxyds, by fusion, colour glasses and enamels.

The metals amount to about forty, and may be divided into *alkalizable* metals, *oxydizable* metals, and *acidifiable* metals.

The *Alkalizable* and earthy metals are, potassium, sodium, barium, strontium, calcium, magnesium, aluminum, glucinum, thorinum, zirconium, silicum, ittrium.

The *Oxydizable* metals are, manganese, zinc, tin, iron, lead, antimony, bismuth, tellurium, cobalt, copper, nickel, uranium, osmium, titanium, cerium, palladium, iridium, rhodium, mercury, silver, gold, platinum.

The *Acidifiable* metals are, tungsten, columbium or tantalium, arsenic, molybdena, chrome.

Such as are employed in medicine, are noticed in their respective places.

MONARDA. *A.* (*Secondary.*)

Monarda. Mountain Balm. The Herb.

What peculiar virtues have given this even a secondary place in our Materia Medica, I know not.

MISTURÆ ET EMULSIONES.—*MIXTURES AND EMULSIONS.*

Under these heads are comprehended those mixtures in which oils and other substances insoluble in water are mixed with, and suspended in, watery fluids, by means of viscid substances, such as mucilage and syrups.

MISTURA AMYGDALÆ. *A.* MISTURA AMYGDALARUM. *L.*

Almond Mixture.

LAC AMYGDALÆ. *D.* *Almond Milk.*

EMULSIO AMYGDALI COMMUNIS. *E.* *Almond Emulsion.*

Take of
- Sweet almonds, blanched, . . . one ounce and a half:
- Double refined sugar, ... half an ounce;
- Distilled water, ... two pints and a half.

Beat the almonds with the sugar; then, rubbing them together, add by degrees the water, and strain the liquor. *D.*

We insert the above, as preferable to that of the United States' Pharmacopœia, which takes no notice of what is to be done with the sugar, nor what kind of almond is to be used.

Emulsio Acaciæ Arabicæ. *E.* Emulsio Arabica. *D.*

Arabic Emulsion.

Take of
Gum arabic in powder, ... two drachms;
Sweet almonds, blanched,
Refined sugar, of each, ... half a drachm;
Decoction of barley, ... one pint.

Dissolve the gum in the warm decoction, and when almost cold, pour it upon the almonds, previously well beaten with the sugar, and at the same time triturate them together, so as to form an emulsion, and then filter.

These emulsions possess nearly the same qualities, and are merely mechanical suspensions of oil of almonds in watery fluids, by means either of the mucilage with which it is naturally combined in the almonds by itself, or assisted by the addition of gum arabic and sugar. Therefore, on standing for some days, the oily matter separates and rises to the top, not in a pure form, but like thick cream. By heat the same decomposition is immediately effected.

Great care should be taken that the almonds have not become rancid by keeping, which not only renders the emulsion extremely unpleasant, a circumstance of great consequence in a medicine that requires to be taken in large quantities, but likewise gives it injurious qualities.

The almonds are blanched by infusing them in boiling water, and peeling them. The success of the preparation depends upon beating the almonds to a smooth pulp, and triturating them with each portion of the watery fluid, so as to form an uniform mixture before another portion be added.

These liquors are principally used for diluting and correcting acrimonious humours; particularly in heat of urine and stranguries, arising either from a natural acrimony of the juices, or from the operation of cantharides, and other irritating medicines: in these cases, they are to be drunk frequently, to the quantity of half a pint or more at a time.

MISTURA CAMPHORÆ. *A. L.*

Mistura Camphorata. *D.* Emulsio Camphoræ. *E.*

Camphor Mixture or Emulsion.

Take of
Camphor, . . . half a drachm;
Alcohol, ... ten minims;
Sugar, ... half an ounce;
Water, ... one pint.

First triturate the camphor with the alcohol, then with the sugar; lastly with the water gradually added, and strain the liquor.

The sugar ordered by our Pharmacopœia, is not directed to be employed in the preparation. It is to be rubbed up with the alcohol and camphor, they being previously united.

This mixture is not very permanent, as the camphor separates and swims upon the surface in the course of a few days. As an extemporaneous prescription, however, it is a very convenient mode of exhibiting that active drug, and may be given to the extent of a table spoonful every three or four hours in typhoid fevers.

There seems to be very little use for this mixture, since the camphor can be much more conveniently given, suspended in milk.

MISTURA AMMONIACI. *A. L.* LAC AMMONIACI. *D.*

Ammoniacum Mixture. Emulsion of Gum Ammoniac.

Take of
Ammoniac, ... two drachms;
Water, ... half a pint.

Rub the gum-resin with the water, gradually poured on, until it becomes an emulsion. *L.* It is then to be passed through linen.

In the same manner may be made an emulsion of assafœtida, and of the rest of the gum-resins.

The lac ammoniaci is employed for attenuating tough phlegm, and promoting expectoration, in humoral asthmas, coughs, and obstructions of the viscera. It may be given in the quantity of two spoonsful twice a day.

The assafœtida emulsion is employed in spasmodical, hysterical, and other nervous affections. And it is also not unfrequently used under the form of injection. It answers the same purposes as assafœtida in substance, but is very disagreeable.

MISTURA AMMONIACI ET ANTIMONII. *A.*

Mixture of Ammoniacum and Antimony. White Mixture.

Take of
Ammoniacum mixture, ... four fluid ounces;
Wine of antimony, ... four fluid drachms;
Syrup of Tolu, ... one fluid ounce;
Opiated tincture of camphor, . . four fluid drachms.
Mix.

MISTURA CALCIS CARBONATIS. *A.*

POTIO CARBONATIS CALCIS. *E.* MISTURA CRETÆ. *L. D.*

Mixture of Carbonat of Lime. Mixture of Chalk.

Take of
- Prepared carbonat of lime, . . . one ounce and a half;
- Sugar, ... one ounce;
- Gum Arabic, in powder, ... half an ounce;
- Oil of cinnamon, ... ten minims;
- Water, ... twenty fluid ounces.

Rub down the gum with four ounces of water. Then rub the oil with the sugar, and afterwards mix the whole together.

This is an useful remedy in diseases arising from, or accompanied with, acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cause. The mucilage not only serves to keep the chalk uniformly diffused, but also improves its virtues. The dose of this medicine requires no nicety. It may be taken to the extent of a pound or two in the course of a day.

This article, as being liable to ferment in the summer, is much better adapted for an extemporaneous prescription.

MISTURA FERRI COMPOSITA. *A. L.*

Compound Mixture of Iron. Myrrh Mixture.

Take of
- Myrrh, in powder, ... one drachm;
- Sub-carbonat of potass, ... twenty-five grains;
- Rose water, ... half a pint;
- Sulphat of iron, in powder, . . one scruple;
- Spirit of lavender, ... half a fluid ounce;
- Sugar, ... one drachm.

Rub together the myrrh, the sub-carbonat of potass and sugar, and during the trituration, add gradually, first the rose water and spirit of lavender, and lastly the sulphat of iron. Pour the mixture immediately into a suitable glass bottle, and stop it close.

This prescription is almost identical with that of the London College. It constitutes the celebrated tonic myrrh mixture of Griffith. As first invented, says Mr. Murray, it was undoubtedly an unchemical mixture, the prescriber not being aware of the changes produced in the active ingredients by their mutual action, but which, in practice, was found possessed of peculiar advantages. The sulphat of iron, it is obvious, is decomposed by the sub-carbonat of potass, the sulphuric acid combining with the potass, while the carbonic acid unites with the oxyd of iron. The carbonat of iron which is formed, is diffused in the mixture along with the myrrh, and both are probably kept more completely suspended by an excess of alkali. This chalybeate proves

much less irritating than the sulphat of iron, producing no unpleasant effect on the stomach, and at the same time it is more active than the common carbonat or rust of iron is at the maximum of oxydation, while, in the present preparation, it is at the minimum, is in a different state of aggregation, and probably combined with a larger quantity of carbonic acid. To preserve it in this low state of oxydation, it is ordered to be kept in a bottle closely stopped; but as iron has a strong tendency to pass to a more highly oxydated state, and suffers this change very rapidly from the action of the air, it is preferable that the preparation should be always extemporaneously made. Griffith's mixture was employed as a remedy in hectic fever, in chlorosis, and other diseases, in which iron is given as a tonic. The mixture of the London Pharmacopœia, which is nearly of the same strength, may be given in the same cases, in a dose of an ounce, once or twice a day. It is employed with the greatest success in those cases of hectic fever which are unattended by any great degree of heat or thirst, and which do not show manifest signs of inflammation. It will in general be found to sit easy on the stomach; but should it disagree, or should hectic fever and flushings prevail to a high degree, the proportion of the ingredients may be changed, or the sulphat of iron altogether omitted.

MISTURA MOSCHI. *A. L.* *Musk Mixture.*

Take of
Musk,
Gum arabic, powdered,
Refined sugar, of each, ... one drachm;
Rose water, ... six fluid ounces.

Rub the musk first with the sugar, then with the gum, and add the rose water by degrees.

Unless the musk be very thoroughly triturated with the sugar and gum before the addition of the water, it soon separates. An ounce, or an ounce and a half, may be taken for a dose.

MISTURA GUAIACI. *L.* *Guaiac Mixture.*

Take of
Guaiac, ... one drachm and a half;
Refined sugar, ... two drachms;
Mucilage of gum arabic, . . . two fluid drachms;
Cinnamon water, ... eight fluid ounces.

Triturate the guaiac with the sugar, then with the mucilage, and during the trituration with these, gradually add the cinnamon water.

This is one of the best forms of exhibiting guaiac, although it is not dissolved, but only mechanically suspended in the mixture, by means of the sugar and mucilage.

MISTURA MAGNESIÆ. *A.* *Magnesia Mixture.*

Take of
Magnesia, ... one drachm;
Water of carbonat of ammonia, . . one fluid drachm;
Cinnamon water, ... three fluid drachms;
Distilled water, ... five fluid ounces and a half.
Mix.

MISTURA CORNU USTI. *L.* DECOCTUM CORNU CERVINI. *D.*

Mixture of Burnt Horn. Decoction of Hartshorn.

Take of
Burnt and prepared hartshorn, ... two ounces;
Gum arabic, in powder, ... one ounce;
Water, ... three pints.
Boil, constantly stirring, down to two pints, and strain.

Prepared hartshorn is phosphat of lime in a minute state of mechanical division. By boiling in a mucilaginous liquid, it is diffused and imperfectly suspended, but not a particle of it is dissolved. This is therefore an extremely injudicious preparation; for phosphat of lime would be much more easily and effectually suspended by triturating it with a larger proportion of gum arabic, and adding the water gradually.

MISTURA ZINCI SULPHATIS. *A.* *Sulphat of Zinc Mixture.*

Take of
Sulphat of zinc, . . . two drachms;
Spirit of lavender, . . two fluid drachms;
Water, ... six fluid ounces.
Mix.

This is a mere simple solution of sulphat of zinc in water, with a very small addition of an aromatic spirit. How, or why it found a place in the Pharmacopœia, may be difficult to say. It is little more than a stronger preparation of the *collyrium* of sulphat of zinc!

ENEMA CATHARTICUM. *D.* *Purging Clyster.*

Take of
Manna, ... one ounce;
Dissolve in ten ounces, by measure, of
Compound decoction of chamomile; then add of
Olive oil, ... one ounce;
Sulphat of magnesia, . . . half an ounce.
Mix them.

Enema Fœtidum. *D.* *Fetid Enema.*

Is made by adding to the former two drachms of the tincture of assafœtida.

These are very useful extemporaneous preparations.

MORUS NIGRA. *L.* *Mulberry Tree.* *The Fruit.*

This tree, which is supposed to have come originally from Persia, bears the cold of the winters, and ripens its fruits in England. The fruit has the same properties with other sub-acid fruits. Its juice contains tartaric acid.

MOSCHUS. *A. E. L. D.* *Musk.*

The musk animal, moschus moschiferus, is an inhabitant of the most elevated region of Asia, particularly of the Altayan Alps, and the mountains which divide Thibet from China. It is a gentle and timid animal, and its chase is difficult and dangerous. Its general form resembles the deer tribe, and it is about three feet in length. In the male, behind the navel and before the prepuce, there is situated an oval bag, flat on one side and convex on the other, about three inches long and two broad, projecting about an inch, and having a small open orifice, beset with short hairs, which is empty in the young animal, but in the adult is filled with a secreted matter, known by the name of musk. When the bag becomes too full, the animal expresses part of its contents by rubbing itself against stones or trees. The musk expressed in this manner is said to be the purest, but none of it probably reaches this country. The best musk is brought from Tonquin, an inferior sort from Agria and Bengal, and a still worse from Russia.

Fine musk comes to us in round thin bladders, which are generally about the size of a pigeon's egg, covered with short brown hairs, lined with a thin brown membrane, well filled, and without any appearance of having been opened. The musk itself is dry, with a kind of unctuosity, of a dark reddish brown, or rusty blackish colour, in small round grains, with very few hard black clots, and perfectly free from sandy or other visible foreign matter. If chewed and rubbed with a knife on paper, it looks smooth, bright, yellowish, and is free from grittiness. Laid on a red-hot iron, it catches flame, and burns almost entirely away, leaving only an exceeding small quantity of light greyish ashes. The largest and fullest bag scarcely contains more than two drachms of musk.

Its taste is somewhat bitterish, and its smell extremely powerful and peculiar. Neumann got from 30 grains of musk, 12 of watery and 4 of alcoholic extract; and inversely, 10 of alcoholic and 6 of watery. Its smell and taste were elevated in distillation with water, but not with alcohol. Neither the fixed nor volatile oils dissolved it.

The very great price of musk, has given rise to many modes of adulterating it. To increase its weight, sand, and even particles of lead, are introduced through very small openings into the bags. The real musk is frequently abstracted from the bag, and its place supplied with dry and coarsely powdered blood, or some mixture with asphaltum. These adulterations are to be detected by discovering that the bag has been opened. The presence of blood is also known by the fetid smell it emits when heated sufficiently, and by the formation of ammonia when rubbed with potass. Asphaltum is known by its shining fracture and melting on hot iron, while musk is converted into charcoal. But there are even artificial bags filled with a composition containing some real musk. These are in general thicker, and covered with longer hair, and want the internal brown membrane which lines the real musk-bag.

Medical use.—Musk is by many still believed to be a medicine of very great efficacy, and for which, in some cases, there is hardly any substitute. When properly administered, it sometimes succeeds in the most desperate circumstances. It raises the pulse, without heating much; it allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion.

It may be employed in every instance of typhus fever, especially when attended with delirium, or spasmodic affection of any particular organ, or of the whole system, or subsultus tendinum, &c. It is also used with the greatest benefit in exanthematous and phlegmonic diseases, accompanied with typhoid fever; and in many spasmodic affections, as chincough, epilepsy, trismus, &c.

It is most conveniently given in substance in powder, in doses of three grains or upwards, repeated every one or two hours. Its best preparation is the tincture.

Chemical Composition.—Resin combined with volatile oil, and a mucilaginous extractive matter, with small portions of albumen, gelatine, muriat of ammonia and phosphat of soda.

The best form of exhibition is that of bolus, combined with ammonia, camphor, or some similar remedy. The musk mixture of the London College, in which it is followed by our Pharmacopœia, has not a sufficient quantity of gum in its composition to retain the musk in suspension; it requires five times its weight of mucilage for that purpose.

Dose, from ten to thirty grains.

MUCILAGINES.—*MUCILAGES.*

Mucilago Amyli. *D. E. L.* *Mucilage of Starch.*

Take of
Starch, ... half an ounce;
Water, ... one pound;
Triturate the starch, gradually adding the water; then boil them a little.

The mucilage thus formed is very useful in those cases where a glutinous substance is required; it is often successfully employed as a clyster, in diarrhœas depending on acrimony in the intestines.

Mucilago Astragali Tragacanthæ. *E.*

Mucilago Gummi Tragacanthæ. *D.*

Mucilage of Gum Tragacanth.

Take of
Tragacanth, ... half an ounce;
Distilled water, ... ten ounces by measure.
Macerate them, with a gentle heat, till the tragacanth be dissolved.

Gum Tragacanth is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution it must be beaten into a paste with some of the water; and the rest of the water must be added gradually, and incorporated with the paste by beating them together. Gum tragacanth is a very tenacious substance, and requires a very large proportion of water to form a fluid mucilage.

Mucilago Acaciæ. *L.* Mucilago Acaciæ Arabicæ. *E.*

Mucilago Gummi Arabici. *D.*

Mucilage of Gum Arabic.

Take of
Gum arabic, in powder, ... one part;
Boiling water, ... two parts.
Digest, with frequent agitation, until the gum be dissolved; then pass the mucilage through linen.

It is very necessary to pass the mucilage through linen, in order to free it from pieces of wood and other impurities, which always adhere to the gum: the linen may be placed in a funnel.

Mucilage of gum arabic is very useful in many operations in pharmacy; it is also much used for properties peculiar to those substances of its own class, and of all the gums it seems to be the purest.

The *incompatible substances* with this mucilage, are *strong* acids and alcohol, sulphuric ether, tincture of muriated iron, sub-acetat of lead, volatile alkali, hard calcareous waters. Gum Arabic contains an astringent principle, which is capable of decomposing some of the metallic salts; thus, ten grains of nitrat of silver are decomposed by two drachms of gum arabic.

The pharmaceutical use of this mucilage depends upon its rendering expressed and essential oils, balsams, resins, gum-resins, resinous tinctures and fatty bodies, miscible with water, but if a syrup be added, the union will be more perfect; the proportions necessary vary according to the nature of the substance; thus, oils require about three-fourths of their weight, balsams and spermaceti an equal part, resins a double quantity, and musk five times its weight.

Decoctum Cydoniæ. *L.* *Decoction of Quince Seeds.*

Take of
Quince-seeds, ... two drachms;
Water, ... one pound.
Boil with a slow fire for ten minutes; then pass it through linen. *L.*

This mucilage, though sufficiently agreeable, is perfectly superfluous, especially as it is apt to spoil, from being mixed with the other principles of the seeds soluble in water. It is besides never so transparent as mucilage carefully prepared from gum arabic, is not cheaper, and is unfit for many purposes, being coagulated by acids.

MURIAS.—*MURIAT.*

Muriat is the generic term for those secondary compounds which contain muriatic acid.

The muriats have a more or less pure salt taste. They are not acted upon by any combustible body. They are all soluble in water, and are the most volatile and most difficultly decomposed by heat of the neutral salts. They emit white fumes with the sulphuric acid, and oxy-muriatic acid gas (chlorine) with the nitric. The officinal muriats are those of ammonia, soda, baryta, lime, mercury and antimony. According to Davy's view of muriatic acid and chlorine, the *first only* is a muriat, the others are chlorides of the respective metals.

The muriats may be divided into three families:

1. Alkaline muriats, soluble in water, fusible, and vaporizable without decomposition, forming no precipitate with alkaline carbonats.

2. Earthy muriats, soluble in water in general, decomposable by heat, forming a white precipitate with alkaline carbonats.

3. Metalline muriats. The muriatic acid is capable of combining with many metals, in two states of oxydizement. The muriats which contain the metal in the state of protoxyd, are in general very acrid, and soluble both in water and alcohol. The muriats which contain the metal in the state of peroxyd are often insoluble, have a white colour, and contain an excess of base, or are sub-muriats. The muriats are also the most volatile metalline salts, and often rise undecomposed in sublimation or distillation.

ACIDUM MURIATICUM. *A. E. L. D.*

Muriatic Acid. Hydrochloric Acid.

Take of

Dried muriat of soda, ... two pounds;
Sulphuric acid, by weight, . . . twenty ounces;
Distilled water, ... a pint and a half.

First mix the acid with half a pint of the water in a glass retort, and add to the mixture after cooling the muriat of soda. Pour the rest of the water into the receiver; then, having fitted on the retort, distil the muriatic acid over into this water, with the heat of a sand bath, gradually increased until the retort become red.

The specific gravity of this acid is 1160 to distilled water at 1000.

If a piece of limestone be put into a fluid ounce of this acid diluted with water, 220 grains should be dissolved.

In this process the muriat of soda is decomposed, and the muriatic acid disengaged by the superior affinity of the sulphuric acid. But as muriatic acid is a permanently elastic fluid, the addition of the water is absolutely necessary for its existence in a fluid form. The London and Edinburgh Colleges put a portion of water into the receiver, for the purpose of absorbing the muriatic acid gas, which is first disengaged, and which would otherwise be lost for want of water to condense it: the Dublin College, however, orders the whole of the water to be previously mixed with the sulphuric acid; and it is indispensably necessary that the mixture of acid and water be allowed to cool before it be added to the salt; for the heat produced is so great, that it would not only endanger the breaking of the retort, but occasion considerable loss and inconvenience, by the sudden disengagement of muriatic acid gas. Dr. Powell thinks it is an improvement to add the salt to the diluted acid, but it is less convenient.

Mr. Phillips has given us a tabular view of the results of the processes of the London Pharmacopœias, 1809 and 1787, and of a modification of the latter.

	Mur. soda.	Sulph. acid.	Water.	Cost.	Product.	Sp. gr.	Marble decomp.
1787	35	21	17.5	56	29.75	1.188	15.09.
Modif.	35	21	22.	56	35.	1.174	16.43.
1809	32	24	39.4	56	43.68	1.142	17.16.

It may be observed, that, according to these experiments, the new process does not produce an acid nearly of the strength ordered by the college, its specific gravity being 1.142 instead of 1.160, and the fluid ounce decomposing only 204 instead of 220 grains of marble, while muriatic acid from Apothecaries' Hall is of specific gravity 1.158. The difference of strength from the statement in the edition 1809 was greater, as the specific gravity was said to be 1.170, and the solvent power 240; it may now be accounted for by some variation in the manipulation, especially as Dr. Powell quotes the present statement as the result of experiment. At any rate, the new process is more economical, as at a given expense it produces a greater solvent power.

The muriat of soda, which should be of the kind called Bay Salt, is directed by Dublin and Edinburgh to be heated to redness, before it be introduced into the retort, that the whole of the water of crystallization may be expelled, which being variable in quantity, would otherwise affect the strength of the acid produced; and besides, without this precaution, the acid obtained is too high coloured. The London College use the salt dried but not decrepitated.

The charge should not occupy more than half the body of the retort; and if a common retort and receiver be employed for this distillation, they must not be luted perfectly close, for if any portion of the gas should not be absorbed by the water employed, it must be allowed to escape; but the process will be performed with greater economy, and perfect safety, in a Woulfe's, or some similar apparatus. The muriatic acid gas, on its condensation, gives out, according to Dr. Powell, a considerable heat, so that it is necessary to keep the receiver cooled during the process.

The residuum in the retort consists principally of sulphat of soda, which may be purified by solution, and crystallization; and to save the retort, Dr. Powell directs it to be filled with boiling water, after the process is over, and it has cooled down to 212°.

If properly prepared, the muriatic acid is perfectly colourless, and possesses the other properties already enumerated; but in the shops it is very seldom found pure. It almost always contains iron, and very frequently sulphuric acid or copper. The copper is detected by the blue colour produced by super-saturating the acid with ammonia, the iron by the black or blue precipitate formed with tincture of galls or prussiat of potass. The sulphuric acid may be easily got rid of by re-distilling the acid from a small quantity of dried muriat of soda. But Mr. Hume discovered, that muriat of baryta is precipitated when poured into pure muriatic acid, from the acid attracting the water of the salt.

Medical use.—In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almost proves, that they do not act by oxygenizing the system. On the contrary, according to Sir H. Davy's view of its constitution, it contains no oxygen, and can only act *chemically* by imparting chlorine or hydrogen to the system, or withdrawing from it oxygen or some other principle which has an affinity for chlorine or hydrogen.

ACIDUM MURIATICUM DILUTUM. *D.* *Diluted Muriatic Acid.*

Take of
Muriatic acid,
Distilled water, each one pound. Mix.
The specific gravity is 1080.

This diluted acid of a fixed strength, is convenient for apportioning its dose; and as it is now introduced by the Dublin College, it is to be hoped that the same proportions will be adhered to by the others.

Table of the quantity of real Acid in 100 *parts of Liquid Muriatic Acid, at the temperature of* 60°. *Dalton.*

Atoms. Acid.		Water.	Acid per cent. by weight.	Acid per cent. by measure.	Specific Gravity.	Boiling Point. 60°.
1	+	1	73.3			
1	+	2	57.9			
1	+	3	47.8	71.7?	1.50	
1	+	4	40.7			
1	+	5	35.5			
1	+	6	31.4			
1	+	7	28.2			
1	+	8	25.6	30.5	1.199	120
1	+	9	23.4	27.5	1.181	145
1	+	10	21.6	25.2	1.166	170
1	+	11	20.0	23.1	1.154	190
1	+	12	18.7	21.4	1.144	212
1	+	13	17.5	19.9	1.136	217
1	+	14	16.4	18.5	1.127	222
1	+	15	15.5	17.4	1.121	228
1	+	20	12.1	13.2	1.094	232
1	+	25	9.91	10.65	1.075	228
1	+	30	8.40	8.93	1.064	225
1	+	40	6.49	6.78	1.047	222
1	+	50	5.21	5.39	1.035	219
1	+	100	2.65	2.70	1.018	216
1	+	200	1.36	1.37	1.009	214

Table of the quantity of Muriatic Acid Gas in solutions of different Specific Gravities. Sir H. Davy.

At temperature 45° *Fahrenheit. Barometer* 30. 100 parts of solution of muriatic acid gas in water, of specific gravity		Of muriatic acid gas, parts	*At temperature* 45° *Fahrenheit. Barometer* 30. 100 parts of solution of muriatic acid gas in water, of specific gravity		Of muriatic acid gas, parts
1.21	Contain	42.43	1.10	Contain	20.20
1.20*		40.80	1.09		18.18
1.19		38.38	1.08		16.16
1.18		36.36	1.07		14.14
1.17		34.34	1.06		12.12
1.16		32.32	1.05		10.10
1.15		30.30	1.04		8.08
1.14		28.28	1.03		6.06
1.13		26.26	1.02		4.04
1.12		24.24	1.01		2.02
1.11*		22.3			

Aqua Alcalina Oxymuriatica. *D.* *Oxymuriatic Alkaline Water.*

Take of
Dried muriat of soda, ... two pounds;
Manganese, in powder, ... one pound;
Water,
Sulphuric acid, each . . . . two pounds.

Mix the muriat of soda and manganese; put them into a matrass, and pour on the water. Then, by means of a proper apparatus, add the sulphuric acid gradually, and at different times, and pass the gas thus extricated through a solution of four ounces of carbonat of potass, in twenty-nine ounces, by measure, of water. Towards the end of the operation, heat the matrass moderately.
The specific gravity is 1087.

This is commonly considered as a solution of the oxygenated muriat of potass; the oxymuriatic acid is disengaged in the matrass by the action of the sulphuric acid on the muriat of soda, and black oxyd of manganese, which latter furnishes the additional dose of oxygen to the muriatic acid disengaged from the former; and the oxymuriatic acid gas thus formed, readily combines with the potass of the solution of the alkaline salt, through which it is made to pass while the carbonic acid is expelled.

But, according to Sir Humphrey Davy, this is a combination of chlorine with potass: the hydrogen of the muriatic acid in the muriat of soda combining with the oxygen of the black oxyd of manganese, the chlorine is set at liberty, and combines with the potass dissolved in the water through which it is made to pass.

Oxymuriat of potass in solution was some years ago strongly recommended as an antisyphilitic remedy, and its use extended to

other cutaneous diseases, and finally to fever and spasmodic diseases, as a general stimulant. It was given in the dose of from three to ten grains, four times a day, gradually increasing to 25 or 30. At the time, many singular cures performed by means of it were recorded, but it has fallen into disuse, and we do not now hear of its employment; although its introduction so lately into the Dublin Pharmacopœia would lead us to presume that it is still used in Ireland. It sometimes acted as a diuretic, always as a stimulant; and it is singular, that in some cases, in which it produced little or no effect, it passed off undecomposed in the urine. In these cases Mr. Cruickshank proposed to remedy the defect, by giving, after each dose, 10 or 15 drops of muriatic acid.

Aqua Oxymuriatica. *D.* *Oxymuriatic Water.*

Is prepared by transmitting, in a proper apparatus, the superfluous gas of the preceding process through a pint of water.

The specific gravity is 1003.

The oxygenated muriatic acid was also, when the chemical pathology was fashionable, recommended as an antisyphilitic remedy, and it certainly seemed, in some instances, to effect cures; but it has since been laid aside. Mr. Braithwaite also recommended it strongly in scarlatina. He gave, according to the age of the patient, from half a drachm to a drachm, in the course of the day, mixed with eight ounces of distilled water; but it is advisable to divide it into doses, in different phials, as it loses every time the phial is opened, and it should be kept in a dark place. Dr. Willan confirms its use in cynanche maligna. The vapours of powerfully decomposing acid have been recommended by Morveau as the best means of destroying contagion. As, however, they are deleterious to animal life, they cannot be employed in every situation. Where applicable, they are easily disengaged by mixing together ten parts of muriat of soda, and two parts of black oxyd of manganese in powder, and pouring upon the mixture, first four parts of water, and then six parts of sulphuric acid. Fumes of oxygenized muriatic acid are immediately disengaged.

Morveau has since contrived what he calls Dis-infecting or Preservative phials. If intended to be portable, 46 grains of black oxyd of manganese, in course powder, are to be put into a strong glass phial, of about $2\frac{1}{3}$ cubic inches capacity, with an accurately ground stopper, to which must be added about $\frac{45}{100}$ of a cubic inch of nitric acid of 1.4 specific gravity, and an equal bulk of muriatic acid of 1.134; the stopper is then to be replaced, and the whole secured by inclosing the phial in a strong wooden case, with a cap which screws down so as to keep the stopper in its place. They are used by simply opening the phial without approaching it to the nose, and shutting it as soon as the smell of the muriatic gas is perceived. A phial of this kind, if properly prepared, will preserve its power during many years. For small wards, strong bottles, with ground stop-

pers an inch in diameter, of about 25 or 27 cubic inches of capacity, may be used, with 372 grains of the oxyd, and 3.5 inches of each of the acids, and the stopper kept in its place by leaden weights; or for larger wards, very strong glass jars, about 43 cubic inches in capacity, containing an ounce of the oxyd, and six inches of each of the acids. These jars are to be covered with a plate of glass, adjusted to them by grinding with emery, and kept in its place by a screw. In no case is the mixture to occupy more than one-third of the vessel.

MYRISTICA. *A.* MYRISTICA MOSCHATA. *E. D. L.*

Nutmeg Tree. The Nutmeg, its Oil. Mace and its Oil.

Monoecia Monandria.—Nat. ord. *Oleraceæ.*

The tree which furnishes this elegant spice is a native of the Molucca islands. It is not, however, cultivated in any of them except Banda, from which all Europe has been hitherto supplied with mace and nutmegs. The entire fruit is about the size of a peach, and is marked with a longitudinal furrow. The external covering is smooth, fleshy, and bitter. As the fruit ripens, this bursts and discloses the mace, which is an oily membranous pulp, of a dark-red colour and aromatic flavour, divided into narrow branched slips. Within the mace is inclosed the nut, which consists of a brown, thin, hard shell, and a fat parenchymatous kernel, of an oval shape. The fruit is gathered three times a year. The external covering is separated on the spot, and the mace and nut carried home, where they are carefully dried in the sun. After they are dried, the nutmegs are dipt in lime water, and the mace is sprinkled with salt water, probably to preserve them from the attacks of insects.

Mace by drying acquires a reddish-yellow colour. When good, it is flexible, thin, oily, of a deep colour, strong agreeable smell, and an aromatic, bitterish, acrid taste. When brittle, divided into fewer slips of a whitish or pale yellow colour, and of little smell or taste, it is to be rejected.

Neumann got from 7680 parts of mace, 2160 alcoholic, and 1200 watery extract; and inversely, 1920 watery, and 1440 alcoholic extract, with 300 of volatile oil heavier than water, which arose during the inspissation of the watery extract. The expressed oil of mace is less consistent than that of nutmegs.

Nutmegs are oval, flattened at both ends, of a grey-brown colour, and reticularly furrowed on the outside, of a yellow colour within, variegated with brown undulating lines, solid, hard, unctuous to the feel, and easily cut with a knife; and have a balsamic smell, and agreeable aromatic taste. The small round nutmegs are better than the large oval ones; and they should have a strong smell and taste, and should neither be worm-eaten, musty, nor variegated with black

lines. Their activity is, however, confined to the dark coloured veins which are not apt to be worm-eaten.

Neumann got from 1920 parts of nutmeg, 480 of an oily alcoholic extract, and 280 watery, with 320 fixed oil: these two last were both insipid: and inversely 600 watery extract, with 50 of fixed oil, which rose to the surface during the inspissation, and 10 of volatile oil which distilled over; and afterwards, 120 unctuous alcoholic extract, and 300 more of fixed oil. By expression 1920 gave 540 of oil, and afterwards 480 of watery extract, a pretty strongly tasted distilled water, and 80 unctuous alcoholic extract, with 60 of insipid fixed oil.

Volatile Oil of Nutmeg.

By distillation nutmegs yield a considerable quantity of essential oil, of a whitish yellow colour, lighter than water, and possessing the aromatic taste and smell in an eminent degree. In doses of a few drops it is a powerful carminative stomachic.

Expressed Oil of Mace.

Nutmegs also yield by expression a considerable quantity of limpid yellow oil, which on cooling concretes into a sebaceous consistence. They are previously beaten to a soft paste in a warm mortar, then enclosed in a linen bag, exposed to the vapour of hot water, and squeezed in a press, of which the plates have been heated.

It is a mixture of the volatile oil, on which their flavour depends, and of a fixed oil, of a white colour, without taste or smell; and as the properties which characterize it depend on the presence of the volatile oil, the denomination of Fixed Oil, applied to it by the Edinburgh College, is less correct than that of Expressed Oil, given to it by the other Colleges, from the manner of its preparation.

In shops we meet with three sorts of unctuous substances called Oil of Mace, though really expressed from the nutmeg. The best is brought from the East Indies in stone jars; this is of a thick consistence, of the colour of mace, and an agreeable fragrant smell: the second sort, which is paler coloured, and much inferior in quality, comes from Holland in solid masses, generally flat and of a square figure: the third, which is the worst of all, and usually called Common Oil of Mace, is an artificial composition of suet, palm oil, and the like, flavoured with a little genuine oil of nutmeg. 7680 of the second sort yielded to Neumann 330 volatile oil heavier than water, 2880 of fluid expressible oil, and 4560 of solid but fusible sebaceous matter, perfectly insipid, inodorous, and of a chalky whiteness.

Medical use.—Both mace and nutmegs are rather to be considered as aromatic spices than as articles of medicine. From the essential oil they contain they are heating and stimulating, and they are added to other medicines for the sake of their agreeable flavour.

MYROXYLON. *A.* Myroxylon Peruiferum. *E. L. D.*
Balsam of Peru. Sweet Smelling Balsam Tree. The Balsam. Peruvian Balsam. *See Page* 144.

MYRRHA. *A. E. L. D.*

Myrrh. The Gum-Resin of a non-descript Tree.

The tree which produces this gum-resin, is not yet ascertained. Mr. Bruce has given some reasons for supposing that it is a mimosa; but we may observe, that all the mimosas with which we are sufficiently acquainted furnish a pure gum, and not a gum-resin. The best myrrh is brought from Troglodytitia, a province of Abyssinia, on the borders of the Red Sea; but what we receive comes from the East Indies, and is produced on the eastern coast of Arabia Felix.

The best myrrh is in the form of tears. It should be of a yellow, or reddish-yellow colour, becoming redder when breathed on, light, brittle, of an unctuous feel, pellucid, shining; presenting white semi-circular striæ in its fracture; of a very bitter aromatic taste, and a strong, peculiar, not unpleasant odour. It is not good if whitish, dark-coloured, black, resinous, ill-smelled, or mixed with impurities, which is too commonly the case.

Neumann ascertained that water and alcohol are both of them capable of taking up the whole of the taste and smell of the myrrh, the extract made by either after the other being insipid. The alcohol distilled from the tincture elevated none of the flavour of the myrrh; but during the inspissation of the decoction a volatile oil arose, containing the whole of the flavour of the myrrh, and heavier than water, while the extract was merely bitter. From 7680 parts of myrrh, he got 6000 watery extract, 180 volatile oil, and 720 alcoholic: and inversely, 2400 alcoholic, and 4200 watery. Braconnot found that myrrh chiefly consisted of a gum, differing from all others. 1. It acquires cohesion by heat, which renders it partly insoluble in water, when the solution is evaporated. 2. It furnishes ammonia by distillation, and nitrogen with nitric acid. 3. It precipitates lead, mercury, and tin, from their solution. Myrrh also contains 2.3 parts in the 100 of a bitter, very fusible, resinous matter. The tincture is transparent, and when poured into water, forms a yellow opaque fluid, but lets fall no precipitate, while the watery solution is always yellow and opaque; myrrh is not fusible, and is difficultly inflammable. Mr. Hatchett found it soluble in alkalies.

Vauquelin obtained from the root of the *Andropogon Schoenanthus*, by means of alcohol, a thick brown oil, having an acrid, burn-

ing taste, like an essential oil, and exactly the smell of myrrh. It differs from myrrh chiefly in having less solidity; but Vauquelin thinks, that if it was united to a gummy matter, it would exactly resemble it. He does not suppose, however, that this is the plant which produces the myrrh of commerce, but considers it as a proof that myrrh is formed in various vegetables.

Medical use.—Myrrh is a heating stimulating medicine. It frequently occasions a mild diaphoresis, and promotes the fluid secretions in general. Hence it proves serviceable in cachectic diseases, arising from inactivity of the system, and is supposed to act especially upon the uterine system, and to resist putrefaction.

It is exhibited,

1. In substance; in the form of powder, or made up into pills, in doses of ten to sixty grains.
2. Dissolved in water, as in Griffith's famous but unchemical myrrh mixture.
3. Dissolved in alcohol.

MYRTUS PIMENTO. *E. L. D.* PIMENTA. *A.*

Pimento. Allspice. Jamaica Pepper. The Berries.

Icosandria Monogynia.—Nat. ord. *Hesperidæ.*

This is a native of Jamaica, and grows in all the woodlands on the north side. Soon after the trees have blossomed, the berries become fit for gathering; the fruit not being suffered to ripen, as in that state it is moist and glutinous, and therefore difficult to cure, and when dried becomes black and tasteless. The berries are dried by spreading them on a terrace, exposed to the sun, for about seven days, during which time they gradually lose their green colour, and become of a reddish brown.

The smell of this spice resembles a mixture of cinnamon, cloves, and nutmegs; its taste approaches to that of cloves, or a mixture of the three foregoing, whence it has received the name of *allspice*.

Neumann ascertained that its flavour resides entirely in a volatile oil heavier than water, and its pungency in a resin or a substance soluble in alcohol and insoluble in water. From 480 parts, he got 120 watery extract, 30 volatile oil, and 20 alcoholic extract; and inversely, 66 alcoholic, and 100 watery.

Medical use.—Pimento is a warm aromatic stimulant, and is much used as a condiment in dressing food. As a medicine, it is advantageously substituted for the more costly spices, especially in hospital practice.

N.

NICOTIANA TABACUM. *E. L. D.* TABACUM. *A.*

Tobacco. The Leaves.

Pentandria Monogynia.—Nat. ord. *Solanaceæ.*

This is an annual plant, a native of America, from whence it was first carried to Europe, about the year 1560; where it is now sometimes cultivated for medicinal use in gardens; but in general it is exported from America in large quantities. The leaves are about two feet long, of a pale green colour whilst fresh, and when carefully dried, of a lively yellowish cast. They have a strong, disagreeable, narcotic smell, and a very acrid burning taste.

The active constituent of tobacco is an essential oil; for, by long boiling, the decoction and extract of tobacco become almost inert; and by distillation an oil is obtained from it, so active, that small animals are almost instantly killed when wounded by a needle dipped in it.

Vauquelin has lately analyzed tobacco, both in its fresh and prepared state. The expressed juice is manifestly acid, and contains a great quantity of albuminous matter, super-malat of lime, acetic acid, nitrat and muriat of potass, muriat of ammonia, a red matter, soluble in alcohol and in water, which swells and becomes charred by heat, and an acrid principle on which its peculiar properties depend. The infusion of prepared tobacco is alkaline, and contains beside the same principles, carbonat of ammonia, and muriat of lime, proceeding from the mutual decomposition of the muriat of ammonia and lime which is added to give it pungency. The principle to which the acrimony of tobacco is owing, is soluble in alcohol and in water, is volatile, but still may be concentrated by slowly evaporating its solution in water, and still more easily its tincture. Its volatility is also diminished by the malic acid with which it is combined. It is obtained in a state nearest to purity in the distilled water of the infusion of the dry, or of the expressed juice of the fresh plant. This water is colourless, but has the acrid smell and taste of tobacco smoke: with acetat of lead and nitrat of mercury, it forms white precipitates, soluble in acids, and with infusion of galls one soluble in alcohol and the alkalies. The principle on which the properties of tobacco depends, seems not easily destructible, as it is the same in the dry and in the fresh plant, and is not destroyed by oxymuriatic acid.

Medical use.—On the living body, whether taken into the stomach in substance or solution, or into the lungs in the form of smoke, or applied to abraded surfaces, tobacco is capable of producing delete

rious effects. It often proves virulently cathartic or emetic, and occasions intolerable cardialgia, anxiety and vertigo.

The system becomes easily habituated to the action of tobacco; and many people use very large quantities of it in various ways as a luxury, without experiencing any other bad effect than what arises from their being unable to relinquish it after the habit is confirmed.

As a medicine it is exhibited in various forms:

1. In substance. When chewed, it causes an increased flow of saliva, and sometimes relieves the toothach; and reduced to powder, it proves an excellent errhine and sternutatory, when snuffed up the nostrils.
2. In infusion in water or wine. Taken in such small doses as to have little effect on the stomach, it proves powerfully diuretic, and was employed by Dr. Fowler with very great success in cases of dropsy and dysuria. It is also applied externally for the cure of psora, tinea, and other cutaneous diseases.
3. In the form of smoke, it is injected into the anus by means of bellows of a peculiar construction. By acting as a stimulus to the rectum, it sometimes succeeds in reviving the vital powers in some kinds of asphyxia, and in evacuating the intestines in cases of obstinate constipation.*

It has likewise been employed with advantage as a bougie in removing strictures of the urethra.†

NITRAS.—*NITRAT.*

Nitrat is the generic term for secondary compounds, which consist of nitric acid, combined with any base.

The *Nitrats*, by the action of fire, furnish impure oxygen gas, mixed with nitrogen, and are reduced to their bases. By the action of concentrated sulphuric acid, they emit a white vapour; and they are capable of supporting combustion.

There are three families of nitrats.

1. Alkaline nitrats;—soluble in water; solubility increased by increase of temperature; crystallizable; forming no precipitate with alkaline carbonats.

2. Earthy nitrats;—soluble in water; forming a white precipitate with alkaline carbonats.

3. Metallic nitrats;—generally soluble, both in water and in alcohol; decomposable by heat, furnishing nitric oxyd gas and leaving the metal oxydized to a maximum.

* See Dr. Brailsford's Inaugural Dissertation on Tobacco.

† See an account, by Dr. Shaw, in the Philadelphia Medical Museum, Vol. II.

POTASSÆ NITRAS. *A. L.* Nitras Potassæ. *E.* Nitrum. *D.*

Nitrat of Potass. Nitre. Saltpetre.

Nitrat of potass is annually produced on the surface of the earth in many countries. For this production, the presence of a calcareous base, heat, and an open, but not too free, communication with dry atmospheric air, are requisite. The putrefaction of organic, especially animal substances, is not necessary to, but accelerates the formation of this salt, by affording the nitrogen in a state in which it combines readily with the oxygen of the atmosphere, and forms the nitric acid. Accordingly, in Germany and France, nitrat of potass is prepared, by exposing mixtures of putrefying animal and vegetable substances, and calcareous earths, to the action of the atmosphere. The salt is afterwards extracted by lixiviation and crystallization. The nitre used in Great Britain is chiefly imported from the East Indies. It is found abundantly in several parts of the United States. As it occurs in commerce, it often contains a little muriat of potass and muriat of soda, from which it is easily purified by dissolving it in boiling water, and filtering it; on cooling, the nitrat of potass crystallizes, and the other salts remain dissolved.

Nitrat of potass has a sharp, bitterish, cooling taste. It shoots in pretty large crystals, which are generally six-sided prisms, terminated by six-sided pyramids; very brittle, and permanent in the atmosphere; soluble in seven times their weight of water at 60°, and in an equal weight at 212°; melting when exposed to a strong heat, giving out at first oxygen, and afterwards nitrogen gas, until the whole acid be decomposed, and the potass alone remain behind. It deflagrates more or less violently with all oxygenizable substances, oxydizing or acidifying them. When dried in a temperature of 70°, it consists, according to Kirwan, of 44 nitric acid, 51.8 potass, and 4.2 water. It is decomposed by the sulphuric acid and baryta, by the muriat and acetat of baryta, and the sulphats of soda, ammonia, magnesia, and alumina.

Medical use.—Taken to the extent of from a drachm to half an ounce in the course of a day, in repeated doses, it diminishes the heat of the body, and the frequency of the pulse, and operates by stool, and acts upon the secretion of urine, but is apt to produce pains in the stomach. In large doses, such as an ounce, taken at one time, it produces the most dreadful symptoms, constant vomiting, purging, mixed with blood, convulsions, and death. Accidents of this kind have happened from its being sold by mistake for sulphat of soda.

It is best given in small doses, as 5 to 20 grains frequently repeated, and is only admissible in inflammatory diseases. Externally it is used in gargles, for inflammatory sore throats.

ACIDUM NITROSUM. *E. D.* *Nitrous Acid.*

Take of
Nitrat of potass, bruised, . . . two pounds ;
Sulphuric acid, ... sixteen ounces.

Having put the nitrat of potass into a glass retort, pour upon it the sulphuric acid, and distil in a sand bath, with a heat gradually increased, until the iron pot begins to be red hot.

The specific gravity of this acid is to that of distilled water as 1520 to 1000.

It has been a subject of controversy whether an acid, entitled to this denomination, and holding the same relation to the nitric, which the sulphurous bears to the sulphuric, has really existence. That the acid, obtained from nitre, has different states of oxygenation, and contains a less quantity of oxygen in proportion to the depth of its colour, is generally admitted. But it has been contended that we are to consider all these varieties as nitric acid, holding in combination variable proportions of nitrous gas; and the principal argument in favour of this theory is that the substance, occasioning the colour, may be separated by the mere application of heat. Sir H. Davy has given the following table, showing the proportion of nitrous gas in nitrous acid of different colours.

		100 parts by weight contain		
	Sp. Gr.	Real Acid.	Nit. Gas.	Water.
Pale yellow,	1.502	90.5	1.2	8.3
Bright ditto,	1.50	88.94	2.96	8.1
Dark orange,	1.480	86.84	5.56	7.6
Light olive,	1.479	86.	6.45	7.55
Dark olive,	1.478	85.4	7.1	7.50
Bright green	1.476	84.8	7.76	7.44
Blue green	1.475	84.6	8.	7.40

Mere dilution with water is sufficient to vary these colours. Thus the dark orange-coloured acid, by dilution, passes through the shades of blue, olive, and bright green. Nitric acid, also, by absorbing nitrous gas, has its specific gravity diminished. Colourless acid, for example, when rendered of pale yellow, becomes lighter in the proportion of 1.51 to 1.502.

It has been argued by Gay Lussac,* that the nitrous acid is as much a distinct and peculiar compound, as any other of the combinations of nitrogen and oxygen. It is formed, he observes, whenever we mix oxygen and nitrous gases in such proportion, that the nitrous gas predominates, viz. about one measure of the former to four of the latter. It is of no consequence which is first added; for the result is invariably a condensible red vapour, containing by measure one of oxygen gas, and three of nitrous gas ; or by weight

Nitrogen, ... 34.49—Oxygen, ... 65.51=100.

* Mémoires d'Arcueil, ii.

ACIDUM NITRICUM. *A. E. L.* *Nitric Acid.*

Take of

Nitrous acid, any quantity.

Pour it into a retort; and having adapted a receiver, apply a very gentle heat, until the reddest portion shall have passed over, and the acid which remains in the retort shall have become nitric acid.

Nitrous acid is of a brown or red colour, exceedingly volatile, and emitting an intolerable and suffocating odour. By the addition of water, its colour is successively changed to blue, green, and yellow. In the state of vapour, it is absorbed by water, oil, and sulphuric acid. It consists of about 70 parts of oxygen, and 30 of nitrogen, or rather of nitric acid and nitric oxyd. It forms nitrites.*

The *nitrites* are characterized by their emitting the nitric acid in orange fumes, on the addition of sulphuric acid.

In this process, the sulphuric acid, by its superior affinity, combines with the potass of the nitre to form sulphat of potass, while nitric acid is separated, and is not only converted into vapour by the application of the heat to the retort, but is also partially decomposed. A portion of oxygen escapes in a gaseous form, and the nitric oxyd gas combines with the nitric acid; so that the liquor condensed in the receiver is nitrous and not nitric acid.

In performing this process, we must take care, in pouring in the sulphuric acid, not to soil the neck of the retort. Instead of a common receiver, it is of advantage to use some modification of Woulfe's apparatus; and as the vapours are extremely corrosive, the fat lute must be used to connect the retort with it. The London College, intending that the product should be *nitric* acid, directs us to continue the process only until red fumes appear; but there are red fumes from the very first. Mr. Stocker says, that by careful distillation, the London process affords nine ounces of straw-coloured nitric acid, specific gravity 1.5404; after which the fumes become deeper red, and the product darker, inclining to orange; but the total product is but slightly coloured, amounts to ten or eleven ounces, and has the specific gravity required. The London College formerly used no more sulphuric acid than what was necessary to expel all the nitric acid, and the residuum was a neutral sulphat of potass, so insoluble, that it could not be got out without breaking the retort. The Edinburgh and Dublin Colleges order as much sulphuric acid as renders the residuum an acidulous sulphat of potass, easily soluble in water, and the London College now employs a still larger quantity.

The manufacturers of nitric acid use *rough nitre*, with one half its weight of sulphuric acid.

Nitrous acid is frequently impure. The presence of sulphuric acid

* It does not form them by direct union, the nitric acid alone unites to the base, and nitrats are formed by the combination.

is detected by nitrat of barytes; but before applying this test, the acid must be diluted, as otherwise the salt itself is precipitated in consequence of the acid attracting the water in which it is dissolved. Sulphuric acid is easily got rid of by re-distilling the nitrous acid from a small quantity of nitrat of potass, and this rectification forms part of the new London process; as, from the large proportion of sulphuric acid used by them, they seem to have anticipated this contamination, which, however, does not take place; not even, according to Mr. Stocker, when the distillation is continued, until the saline mass is brought into a state of fusion.

Muriatic acid is detected by the precipitate formed with nitrat of silver, and may be separated by dropping into the nitrous acid a solution of nitrat of silver, as long as it forms any precipitate, and drawing off the nitrous acid by distillation.

Sir H. Davy has shown, that nitrous acid is a compound of nitric acid and nitric oxyd; and that, by additional doses of the last constituent, its colour is successively changed from yellow to orange, olive green, and blue green, and its specific gravity is diminished. As commonly prepared, the acid is more or less high coloured, and emits red fumes; whereas, pure nitric acid emits only white fumes. Hence the Edinburgh College has given a process for converting nitrous into nitric acid, which Dr. Powell thinks uneconomical, as not only nitrous gas, but a large proportion of the acid itself, passes to waste.

By the application of a gentle heat, the whole of the nitric oxyd is vaporized, and pure colourless nitric acid remains in the retort. The nitric oxyd, however, carries over with it a portion of the acid, and condenses with it in the receiver, in the form of a very high-coloured nitrous acid.

Richter has given the following process for preparing nitric acid: Take of

Purified nitrat of potass, ... seven pounds;
Black oxyd of manganese, ... one pound and two ounces;
Sulphuric acid, . . . four pounds, four ounces and six drachms.

Into a retort capable of containing twenty-four pounds, introduce the nitre and manganese, powdered and mixed, and pour upon them gradually, through a retort funnel, the sulphuric acid. Lute on the receiver with flour and water, and conduct the distillation with a gradually increased heat.

From these proportions, Richter got three pounds nine ounces of very slightly coloured nitric acid. The operation will be conducted with less hazard in a Woulfe's apparatus, or by interposing between the retort and receiver a tubulated adopter, furnished with a bent tube, of which the further extremity is immersed in a vessel containing a small quantity of water.

The specific gravity of nitrous acid is probably stated too high by the Edinburgh College; for, although Rouelle makes that of the strongest nitric acid 1.583, yet Kirwan could produce it no stronger

at 60° than 1.5543. Sir H. Davy makes it only 1.504, and when saturated with nitric oxyd, only 1.475; and Mr. Phillips says it varies from 1.509 to 1.519.

Acidum Nitrosum Dilutum. *E. D.* *Diluted Nitrous Acid.*

Take of
Nitrous acid,
Water, equal weights.
Mix them, taking care to avoid the noxious vapours.

Nitrous acid has a great affinity for water, and attracts it from the atmosphere. During their combination there is an increase of temperature, part of the nitric oxyd is dissipated in the form of noxious vapours, and the colour changes successively from orange to green, and to blue, according as the proportion of water is increased. A mixture of equal parts of Kirwan's standard acid of 1.5543 and water, has the specific gravity 1.1911. The diluted acid of the London Pharmacopœia is about 1.08.

In fact, one ounce of nitric acid, by measure, is equal to one ounce, three drachms, 21.75 grains, by weight; and one liquid ounce saturates about 48 grains of white marble. The strength of the diluted nitric acid of the former London Pharmacopœia is to that of the present as 4 to 1.

Mr. Henry, in his chemistry, speaking of nitric acid, says, "pure nitric acid may be considered as a gaseous body, of the specific gravity, compared with common air, of 2440: one hundred cubic inches at 55° Fahrenheit and under 30 inches pressure, weigh, according to Sir H. Davy, 76 grains; or corrected to the temperature of 60° Fahrenheit, they weigh 75.21 grains. The liquid acid (termed by Davy *hydro-nitric acid*) consists of this gas condensed by water, of which it contains various proportions. We have not, however, at present, documents sufficient for the construction of an accurate table of the quantities of *real nitric acid* in acids of different densities. According to Sir H. Davy, the strongest acid (sp. gr. 1.55) contains 14.4 parts of water in 100; and acid of specific gravity 1.42 contains 25.2 of water in 100. The table published by Mr. Dalton, that philosopher has since found reason to believe to be inaccurate; but on the following results, which he has been so good as to communicate to me, he thinks full reliance may be placed."

Table of the quantity of real Acid in Nitric Acid of different densities.

Parts of Acid.		Parts of Water.	Acid per ct. by weight.	Acid per ct. by measure.	Specific Gravity.
45	+	8	84.9	137.5 ?	1.62 ?
45	+	16	73.8	114.4 ?	1.55 ?
45	+	24	65.2	96.4	1.48
45	+	32	58.4	84.	1.44
45	+	40	53.	74.7	1.41
45	+	48	48.4	67.2	1.39
45	+	56	44.5	60.5	1.36
45	+	64	41.3	55.3	1.34
45	+	180	20.	22.8	1.142

Medical use.—The use of these acids in medicine has been considerably extended. In the state of vapour they have been used to destroy contagion in jails, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided. The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but we have heard that success ascribed entirely to the ventilation employed at the same time. Ventilation may unquestionably be carried so far, that the contagious miasmata may be diluted to such a degree that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come in contact with nitric acid or oxymuriatic acid vapour, without being entirely decomposed and completely destroyed. Fumigation is, besides, applicable in situations which do not admit of sufficient ventilation; and where it is, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitric acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick, without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphuric acid are then poured. The fumes of nitric acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. For introducing this practice, Dr. Carmichael Smyth received from the British parliament a reward of five thousand pounds.

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistic and antiseptic drinks we are acquainted with. Hoffman and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, it has been repeatedly given with unequivocal advantage. In the liver complaint of the East Indies, and in syphilis, nitric acid has also been

extolled as a valuable remedy by Dr. Scott, and the evident benefits resulting from its use in these complaints has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain that both the primary and secondary symptoms of syphilis have been removed by the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But in many instances they have failed; and it is doubtful if ever they effected a permanent cure, after the secondary symptoms appeared. Upon the whole, the opinions of Mr. Pearson on this subject, lately agitated with so much keenness, appear so candid and judicious, that we shall insert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea: at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while, at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract, in no inconsiderable degree, the effects of mercury on the mouth and fauces.

NITROGEN.—*AZOTIC OR NITROGEN GAS.*

Nitrogen, or *azotic gas,* constitutes 0.79 parts by bulk of the atmosphere; but as it has few attractions at ordinary temperatures, its principal effect on the chemical properties of the atmosphere seems to be the dilution of the oxygen gas, which in its pure state would be more active than is consistent with the economy of nature. It is permanently elastic, compressible, inodorous, and insipid; it converts very delicate vegetable blues to green; 100 cubic inches weigh between 29 and 30 grains; its specific gravity is 0.0012, water being 1; or 13, hydrogen gas being 1; it is unable to support respiration, vegetation or combustion; it is acidifiable; it dissolves phosphorus and carbon in small quantities, and water absorbs $\frac{1}{75}$ of its volume.

Atmospheric air consists of 21 parts of oxygen gas, and of 79 of azotic gas by measure, or 23.47, and 76.53 by weight; it is transparent, compressible, and permanently elastic; its specific gravity is 0.00123, water being unity; or 13.8, hydrogen being unity; 100 cubic inches weigh 31 grains: it is inodorous and insipid, respirable, and capable of supporting inflammation. The atmosphere also contains other gases, vapour, &c.

Nitrous oxyd gas is composed of 15 in weight of oxygen, and 26

of nitrogen, or of equal volumes of these gases. It does not change vegetable colours ; 100 cubic inches weigh between 48 and 49 grains ; its specific gravity, hydrogen being 1, is 21 ; it suffers no diminution when mixed with oxygen gas. Water absorbs nine-tenths of its bulk, at a mean temperature. It does not combine directly with alkalies ; it supports combustion ; and its respiration, when perfectly pure, or mixed with atmospheric air, produces the highest excitement of which the animal frame seems capable.

Nitric oxyd gas (nitrous gas) consists, according to Sir H. Davy, of 26 nitrogen and 30 oxygen, or of one volume of nitrogen and two of oxygen gas. It does not change vegetable colours; 100 inches weigh about 32 grains ; its specific gravity to hydrogen is 14. When mixed with half its bulk of oxygen gas, the compound condenses into red fumes (nitrous acid,) which are entirely absorbed by water. The quantity of oxygen gas which any air contains is sometimes estimated by the diminution of volume which occurs, after a due proportion of nitrous gas has been added. Water absorbs about one-twentieth of its bulk of this gas. It is not inflammable, and only in very few instances supports combustion. It is noxious to vegetation, and its respiration is fatal to animals.

Nitrous acid gas consists, according to Davy, of 2 measures of nitric oxyd gas, and one of dry oxygen gas, condensed to half their volume. It has a deep orange colour, disagreeable smell and sour taste. It reddens litmus paper, and gives a yellow colour to animal substances. 100 cubic inches weigh 65.3 grains, and its specific graty to hydrogen is 28. It is rapidly absorbed by water, which acquires a tint of green, by ether, oil and sulphuric acid. Its compounds are nitrites.

Hydro-nitrous acid is of a brown or red colour, exceedingly volatile, and emitting an intolerable and suffocating odour. By the addition of water, its colour is successively changed to blue, green and yellow.

Hydro-nitric acid (aqua fortis) consists of nitric acid combined with water. It is liquid, colourless, and transparent. It is very corrosive, and tinges the skin of a yellow colour. When most concentrated, its specific gravity is 1.5543, and it contains 15 *per cent.* water. It produces heat when mixed with water, and absorbs water from the atmosphere. Acid of 1.42 rises unaltered at 248° Fahrenheit. Below 1.4 it strengthens by being boiled, and above 1.45 it becomes weaker. It is decomposed by many substances. Light converts it in part into nitrous acid gas. When highly concentrated, it sets fire to oils, to sulphureted hydrogen gas, to iron-filings, and to zinc, bismuth and tin, when poured on them in a state of fusion. It oxygenizes all the metals, except gold, platinum, and titanium. It consists of five parts, by bulk, of oxygen, and one of nitrogen, combined in the strongest acid with one, and in that of 1.42 with two of water. Its saline compounds are called nitrats.

Chloride of azote. Nitrogen forms a very singular compound with chlorine. It is obtained by confining chlorine over a saturated solution of nitrat of ammonia, at a very low temperature. The gas is

absorbed, and a heavy oil falls, which explodes violently when put in contact with olive oil.

Iodide of Azote, is a blackish powder, which detonates with great force spontaneously, when dry, and by a slight pressure under water.

NUX VOMICA. *A.* STRYCHNOS NUX VOMICA.

Vomic Nut. The Seeds.

This seed has not at present a place in the British pharmacopœias; it presents, however, several points of interest to the physiologist, the physician, and the chemist. Its virulent action upon animals has been long known, and it has been administered in combination with gentian in intermittents,* (*Ludovic. Phar.* p. 113,) and as a narcotic in mania; it also constituted an ingredient in the famous *Electuarium de ovo*, (*Ph. Angl.* p. 263.) Nux vomica has been said to produce benefit in the plague; the German writers have strongly commended it in mania, epilepsy, and hydrophobia; as well as in chronic rheumatism, gout, scrofula, lues venerea, and cutaneous eruptions; in Sweden it is stated to have displayed very beneficial effects in Dysentery. Dr. Fourquier has lately introduced its use in the Hopital de la Charité, in cases of partial paralysis, and it is said, with very great success. The value of the practice has been since confirmed by the experiments of Dumeril, Majendie, Hebreard, Husson, and Asselin. The dose is four or five grains of the powder in pills, during the day. The French codex contains two alcoholic extracts of this substance, the one prepared with a strong spirit (22, 32, Beaumé, i. e. from sp. gr. .915 to .856,) is much more active and powerful than that made with a weak spirit, (12, 22, Beaumé, i. e. from sp. gr. .985 to .915.) MM. Pelletier and Caventou have discovered in this substance, a peculiar proximate principle, to which its virulence is owing; it was named *Vauqueline*, in honour of the celebrated French philosopher, but in deference to the opinion of the French Academy of Sciences, the discoverers have substituted the name *Strychnine*, because "a name dearly loved, ought not to be applied to a noxious principle." (*Annales de Chimie, vol.* 8 to 10.) Strychnine is highly alkaline, and crystallizes in very small four-sided prisms, terminated by four-sided pyramids; its taste is insupportably bitter, leaving a slight metallic flavour; it has no smell; it is so extremely active and violent, that in doses of half a grain it occasions serious effects, and in larger ones, convulsions and death; notwithstanding its strong taste, it is very sparingly soluble in water, requiring 6667 parts of that fluid for its solution at 50, and

* Sir Hans Sloane published a Paper in the Philosophical Transactions, No. 249, Vol. xxi. p. 44, entitled "An Account of the Nux Pepita, or Saint Ignatius's Bean (*Ignatia Amara, Lin.*) A simple in common use in the Philippine Islands, as a tonic medicine."

2500 at 212°. It is very soluble in alcohol; with acids it forms neutral and crystallizable salts; these salts, as well as their base, have the singular property of becoming blood-red by the action of concentrated nitric acid. Strychnine exists in native combination in the Strychnus, with an acid which has some analogy with the malic, and which Pelletier and Caventou propose to call the *Igasuric acid*, from the Malay name for the bean of St. Ignatius,* (Strychnus Ignatius,) in which its properties were first examined. In conformity with such views, the active principle of the tribe of the Strychni is an *Igasurate of Strychnine*. A fact which suggests the existence of a most singular and striking analogy between the chemical constitution of these narcotic-acrid bodies† and that of opium.

O.

OLIVÆ OLEUM. *A. L.*

OLEUM OLIVARUM. *D.* OLEUM FIXUM OLEÆ EUROPÆÆ. *E.*

Olive Oil. Fixed Oil of the Fruit.

OLEA EUROPÆA. *Olive Tree.*

Diandria Monogynia.—Nat. ord. *Sepiariæ.*

The Olive tree is a native of the south of Europe and north of Africa. It is cultivated in France, Spain, and Italy, for the sake of its fruit and the oil expressed from it. Olives, when fresh, have an acrid, bitter, extremely disagreeable, taste; but they are only eaten when pickled. They are first steeped for several days in a ley of wood-ashes, and then pickled in a strong solution of muriat of soda.

They are principally valued for the oil they afford by expression. For this purpose they are gathered when fully ripe, and immediately bruised and subjected to the press. The finest oil flows first, and

* *Strychnine* was obtained from the beans of St. Ignatius by the following process: a portion of the beans being grated was heated in a close vessel, under pressure, with sulphuric ether, by which an oily matter was dissolved; the residuum then yielded by the action of alcohol, a yellowish brown, very bitter substance, which being boiled with pure magnesia and filtered, the colouring matter was washed out, and the *Strychnine* and magnesia, in a state of mixture, remained on the filtre. This strychnine was then separated by alcohol, and thus obtained in a state of great purity.

† The researches of the French and German chemists have considerably multiplied the number of these bodies, to an extent indeed that requires corroboration by farther experiments; thus in STRAMONIUM, we have *Daturia;*—in BELLADONNA, *Atropia;*—in VERATRUM, *Veratria;*—in ANGUSTURA PSEUDO-FERRUGINEA, *Brucina;*—in HYOSCYAMUS, *Hyoscyama*, &c.

a very bad oil is obtained by boiling the magma, which remains after expression in water. According to Beaumé, they are gathered when sufficiently ripe. They are then dried, to deprive the mucilage, of which they contain a large quantity, of its water, and are expressed after being bruised, and moistened with a little water to render the oil more fluid. By rest, the mucilage and water which may have passed with it, separate. It is sometimes mixed with oil of poppy seeds; but, by exposing the mixture to the freezing temperature, the olive oil freezes, while that of the poppies remains fluid; and as oils which freeze with most difficulty are most apt to become rancid, olive is deteriorated by the admixture of poppy oil.

Good olive oil should have a pale yellow colour, somewhat inclining to green, a bland taste, without any rancidity, and no smell, and should congeal at 38° Fahrenheit.

Medical use.—Taken internally, it operates as a gentle laxative, and is given in cases of worms. It is also given in large quantities to mitigate the action of acrid substances taken into the stomach. It is used externally in frictions, in gargles, and in clysters; but its principal employment is for the composition of ointments and plasters.

OILS

Are either Fixed or Volatile.

OLEA FIXA seu EXPRESSA.—*FIXED OR EXPRESSED OILS.*

Fixed oils are transparent, more or less coloured, somewhat viscid, inodorous fluids, having a mild taste and unctuous feel. In the different species, the specific gravity varies from 0.9403 to 0.9153. The point of congelation also differs considerably, but in general it is within the range of the ordinary temperatures of the atmosphere. Their boiling point exceeds 600°, and by being converted into vapour, they become empyreumatic. Fixed oils do not seem capable of combining with charcoal. When assisted by heat, they dissolve sulphur and phosphorus. They may be blended with sugar and gum by trituration as in emulsions, and they dissolve the volatile oils, and resins, and gummy resins. With the alkalies and earths they form soaps, and with metallic oxyds plasters. They are not soluble in water or in alcohol. They unite readily with oxygen, which renders them concrescible. Those oils which dry without losing their transparency, as linseed oil, are termed drying oils, in contra-distinction to the fat oils which from exposure become white, opaque and thick, and remain greasy, such as oil of olives or of almonds. When they become rancid, they undergo a further degree of decomposition, and are found to contain sebacic acid. Oil in a state of vapour is inflammable, and burns with a white flame. When the combustion is complete, the products are carbonic acid gas and water.

but in general soot is deposited. The sulphuric acid renders the fixed oils brown and thick, and converts them into water and charcoal. The nitric acid oxygenizes them. The oxygenized muriatic acid blanches them, and renders them concrete like tallow or wax. The oils oxydize several of the metals, and are oxydized by several of their oxyds. From Lavoisier's experiment on the combustion of olive oil, its constituent principles were estimated at 79 charcoal, and 21 hydrogen; but by correction they appear to be 50.39 carbon, 20.23 hydrogen, and 29.38 oxygen.

These oils are commonly denominated *expressed* oils, an appellation which is manifestly improper, as in some instances they are obtained without expression, and in other instances expression is employed to obtain volatile oils. The Edinburgh college have therefore distinguished these different classes of oils by the term of fixed and volatile, which accurately characterizes them.

Fixed oil is formed in no other part of vegetables than in their seeds. Sometimes, although very rarely, it is contained in the parenchyma of the fruit. Of this the best known example is the olive. But it is most commonly found in the seeds of dicotyledonous vegetables, sometimes also in the fruit of monocotyledonous plants, as the cocos butyracea. It has various degrees of consistency, from the tallow of the croton sebiferum of China, and the butter of the butter-tree of Africa, to the fluidity of olive oil.

Fixed oils are either

1. Fat, easily congealed, and not inflammable by nitric acid; oil of olives, almonds, rapeseed, and ben.
2. Drying, not congealable, inflammable by nitric acid; oil of linseed, nut and poppy.
3. Concrete oils, palm oil, &c.

Fixed oil is separated from fruits and seeds which contain it, either by expression or decoction. Heat, by rendering the oil more limpid, increases very much the quantity obtained by expression; but as it renders it less bland, and more apt to become rancid, heat is not used in the preparation of oils which are to be employed in medicine. When obtained by expression, oils often contain a mixture of mucilage, starch, and colouring matter; but part of these separate in course of time, and fall to the bottom. When oils become rancid, they are no longer fit for internal use, but are said to effect the killing of quicksilver, as it is called, more quickly. Decoction is principally used for the extraction of the viscid and consistent oils, which are melted out by the heat of the boiling water, and rise to its surface.

Those who prepare large quantities of the oil of almonds, blanch them, by steeping them in very hot water, which causes their epidermis to swell, and separate easily: After they peel them, they dry them in a stove, then grind them in a mill like a coffee mill, and lastly, express the oil from the paste inclosed in a hempen bag. By blanching the almonds, the paste which remains within the bag is sold with greater advantage to the perfumers, and the oil obtained is perfectly colourless. But the heat employed disposes the oil to be-

come rancid, and the colour the oil acquires from the epidermis does not injure its qualities. For pharmaceutical use, therefore, the oil should not be expressed from blanched almonds, but merely rubbed in a piece of coarse linen, to separate the brown powder adhering to the epidermis, as much as possible. Sixteen ounces of sweet almonds commonly give five ounces and a half of oil. Bitter almonds afford the same proportions, but the oil has a pleasant bitter taste.

OLEUM AMYGDALARUM. *A. L. D.* OL. AMYGDALÆ COMMUNIS. *E.*

Oil of Almonds.

Take of
Fresh almonds, any quantity.

After having bruised them in a stone mortar, put them into a hempen bag, and express the oil without heat.

In the same manner are to be expressed,

OLEUM LINI. *A. E. D. L.* *Linseed, or Flaxseed Oil.*
——— RICINI. *A. L.* *Castor Oil,* from the seeds previously decorticated.

OLEA VOLATILIA. *E.* OLEA DISTILLATA. *A. L. D.*

VOLATILE OILS. DISTILLED OILS.

Volatile oils differ from the fixed oils most remarkably in being vaporized unchanged by a heat under 212°; by evaporating completely without leaving a stain on paper; by being sapid, often pungent, and odorous; and by being soluble in alcohol, and to a certain degree in water. They are more inflammable than the fixed oils, and burn with a large white flame, emit a great deal of smoke, and require more oxygen for their combustion. By exposure to air they become coloured and thick, and are at last converted into an almost inodorous resin. They are also oxydized and converted into resins by muriat of mercury, and muriat of antimony; the acids act on them with great violence, and are even capable of inflaming them. On the other hand, they resist considerably the action of the alkalies. In their other general properties they agree with the fixed oils, from which they seem to differ in composition, only in containing a larger proportion of hydrogen. In other respects, these oils are infinitely varied, especially in their taste and odour. Some are as limpid as water, others are viscid, others congeal on a slight diminution of temperature, and are even naturally concrete, and others are capable of forming crystallizations. Their predominant colours are the different shades of yellow and red, but there are also blue,

green, and glaucous essential oils. Their specific gravity varies from 0.8697 to 1.0439.

Substances which differ in volatility, may be separated from each other by applying a degree of heat capable of converting the most volatile into vapour, and by again condensing this vapour in a proper apparatus. Water is converted into vapour at 212°, and may be separated by distillation from the earthy and saline matters which it always contains in a natural state. But it is evident, that if any substances which are as volatile as water, be exposed to the same degree of heat, either by immersing them in boiling water, or exposing them to the action of its steam, they will rise with it in distillation. In this way the camphor and volatile oils of vegetable substances are separated from the more fixed principles.

Volatile oils are obtained only from odoriferous substances; but not equally from all of this class, nor in quantity proportional to their degree of odour. Some, which, if we were to reason from analogy, should seem very well fitted for this process, yield extremely little oil, and others none at all. Roses and chamomile flowers, whose strong and lasting smell promises abundance, are found to contain but a small quantity of oil; the violet and jessamine flower, which perfume the air with their odour, lose their smell upon the gentlest coction, and do not afford any oil on being distilled, unless immense quantities are submitted to the operation at once: while savin, whose disagreeable scent extends to no great distance, gives out the largest proportion of volatile oil of almost any vegetable known.

Nor is the same plant equally fit for this operation, when produced in different soils or seasons, or at different times of their growth. Some yield more oil if gathered when the flowers begin to fall off than at any other time. Of this we have examples in lavender and rue; others, as sage, afford the largest quantity when young, before they have sent forth any flowers; and others, as thyme, when the flowers have just appeared. All fragrant herbs yield a larger proportion of oil, when produced in dry soils, and in warm summers, than in opposite circumstances. On the other hand, some of the disagreeable strong-scented plants, as wormwood, are said to contain most oil in rainy seasons, and when growing in moist rich grounds.

Several chemists have been of opinion, that herbs and flowers, moderately dried, yield a greater quantity of volatile oil, than if they were distilled when fresh. It is, however, highly improbable, that the quantity of volatile oil will be increased by drying; on the contrary, part of it must be dissipated and lost. But drying may sometimes be useful in other ways, either by diminishing the bulk of the subject to be distilled, or by causing it to part with its oil more easily; and aromatic waters, distilled from the dry herb, are more fragrant than from the fresh. But the directions of the London College to dry the herb used in the distillation of volatile oils, would be extremely inconvenient, as large quantities of the oils of lavender, peppermint, spearmint, and pennyroyal, are annually distilled in this country from the fresh herb; and the oils of aniseed, chamo-

mile, caraway, juniper, origanum, rosemary and pimento, are usually imported.

The choice of proper instruments is of great consequence for the performance of this process to advantage. There are some oils which pass freely over the swan neck of the head of the common still: others, less volatile, cannot easily be made to rise so high. For obtaining these last, we would recommend a large low head, having a rim or hollow canal round it: in this canal, the oil is detained in its first ascent, and thence conveyed at once into the receiver, the advantages of which are sufficiently obvious.

We cannot separate the volatile oil from aromatic substances by distilling them alone, because the proportion of these oils is so small, that they could not be collected; and besides, it would be impossible to regulate the heat so as to be sufficient, and yet not to burn the subject, and destroy the product. Hence it is necessary to distil them with a proportion of water, which answers extremely well, as the oils are all more volatile in water, and soluble in it only to a certain extent.

With regard to the proportion of water to be employed; if whole plants, moderately dried, are used, or the shavings of wood, as much of either may be put into the vessel as, lightly pressed, will occupy half its cavity; and as much water may be added as will fill two-thirds of it. When fresh and juicy herbs are to be distilled, thrice their weight of water will be fully sufficient; but dry ones require a much larger quantity. In general, there should be so much water, that after all intended to be distilled has come over, there may be liquor enough left to prevent the matter from burning to the still. The water and ingredients, altogether, should never take up more than three-fourths of the still; there should be liquor enough to prevent any danger of empyreuma, but not so much as to be in danger of boiling over into the receiver.

The subject of distillation should be macerated in the water until it be perfectly penetrated by it. To promote this effect, wood should be thinly shaved across the grain, or sawn, roots cut transversely into thin slices, barks reduced into coarse powder, and seeds slightly bruised. Very compact and tenacious substances require the maceration to be continued a week or two, or longer; for those of a softer and looser texture, two or three days are sufficient, while some tender herbs and flowers not only stand in no need of maceration, but are even injured by it. The fermentation which was formerly prescribed in some instances, is always hurtful.

The fire ought to be quickly raised, and kept up during the whole process; but to such a degree only, that the oil may freely distil; otherwise the oil will be exposed to an unnecessary heat; a circumstance which ought, as much as possible, to be avoided. Fire communicates to all these oils a disagreeable impregnation, as is evident from their being much less grateful when newly distilled, than after they have stood for some time in a cool place; and the longer the heat is continued, the greater alteration it produces in them.

The greater number of oils require for their distillation the heat

of water strongly boiling; but there are many also which rise with a heat considerably less; such as those of lemon and citron peel, of the flowers of lavender and rosemary, and of almost all the more odoriferous kinds of flowers. We have already observed, that these flowers have their fragrance much injured, or even destroyed, by beating and bruising them; it is impaired also by the immersion in water in the present process, and the more so in proportion to the continuance of the immersion and the heat; hence oils, distilled in the common manner, prove much less agreeable in smell than the subjects themselves. For the distillation of substances of this class, another method has been contrived: instead of being immersed in water, they are exposed only to its vapour. A proper quantity of water being put into the bottom of the still, the odoriferous herbs or flowers are laid lightly in a basket, of such a size that it may enter into the still, and rest against its sides, just above the water. The head being then fitted on, and the water made to boil, the steam, percolating through the subject, imbibes the oil, without impairing its fragrance, and carries it over into the receiver. Oils thus obtained, possess the odour of the subject in an exquisite degree, and have nothing of the disagreeable scent perceivable in those distilled by boiling them in water in the common manner.

Plants differ so much, according to the soil and season of which they are the produce, and likewise according to their own ages, that it is impossible to fix the quantity of water to be drawn from a certain weight of them to any invariable standard. The distillation may always be continued as long as the liquor runs well flavoured off the subject, but no longer.

The mixture of water and oil which comes over may either be separated immediately, by means of a separatory, or after it has been put into large narrow-necked bottles, and placed in a cool place, that the portion of oil which is not dissolved in the water may rise to the top, or sink to the bottom, according to its specific gravity. It is then to be separated, either by a separatory, or by means of a small glass syringe; or by means of a filter of paper; or, lastly, by means of a woollen thread, one end of which is immersed in the oil, and the other lower end in a phial: the oil will thus pass over into the phial by capillary attraction, and the thread is to be squeezed dry.

The water employed in the distillation of volatile oils always imbibes some portion of the oil, as is evident from the smell, taste, and colour, which it acquires. It cannot, however, retain above a certain quantity; and hence, such as have been already used, and, therefore, almost saturated, may be advantageously employed, instead of common water, in a second, or any future distillation of the same subject.

After the distillation of one oil, particular care should be had to clean the worm perfectly before it be employed in the distillation of a different substance. Some oils, those of wormwood and aniseeds for instance, adhere to it so tenaciously, as not to be melted out by heat, or washed off by water; the best way of removing these, is to run a little spirit of wine through it.

Volatile oils, after they are distilled, should be suffered to stand for some days, in vessels loosely covered with paper, till they have lost their disagreeable fiery odour, and become limpid: then put them up in small bottles, which are to be kept quite full, and closely stopped, in a cool place. With these precautions, they will retain their virtues in perfection for many years.

Most of the oils mentioned above are prepared by the chemists in Britain, and are easily procurable in a tolerable degree of perfection: but the oils from the more expensive spices, though still introduced among the preparations in the foreign Pharmacopœias, are usually imported from abroad.

These are frequently so much adulterated, that it is not easy to meet with such as are at all fit for use: nor are these adulterations easily discoverable. The grosser abuses, indeed, may be readily detected. Thus, if the oil be mixed with alcohol, it will turn milky on the addition of water; if with expressed oils, alcohol will dissolve the volatile, and leave the other behind; if with oil of turpentine, on dipping a piece of paper in the mixture, and drying it with a gentle heat, the turpentine will be betrayed by its smell. But the more subtile artists have contrived other methods of sophistication, which elude all trials of this kind.

Some have looked upon the specific gravity of oils as a certain criterion of their genuineness. This, however, is not to be absolutely depended on; for the genuine oils, obtained from the same subjects, often differ in gravity as much as those drawn from different ones. Cinnamon and cloves, whose oils usually sink in water, yield, if slowly and carefully distilled, oils of great fragrancy, which are specifically lighter than the aqueous fluid employed in their distillation; whilst, on the other hand, the last runnings of some of the lighter oils prove sometimes so ponderous as to sink in water.

As all volatile oils agree in the general properties of solubility in spirit of wine, sparing solubility in water, miscibility with water, by the intervention of certain intermedia, volatility in the heat of boiling water, &c. it is plain that they may be variously mixed with each other, or the dearer sophisticated with the cheaper, without any possibility of discovering the abuse by any trials of this kind; and, indeed, it would not be of much advantage to the purchaser, if he had infallible criteria of the genuineness of every individual oil. It is of as much importance that they be *good*, as that they be *genuine;* for genuine oils, from inattentive distillation, and long and careless keeping, are often weaker, both in smell and taste, than the common sophisticated ones.

The smell and taste seem to be the only certain tests of which the nature of the thing will admit. If a bark should have in every respect the appearance of good cinnamon, and should be proved indisputably to be the genuine bark of the cinnamon tree; yet if it want the cinnamon flavour, or has it but in a low degree, we reject it; and the case is the same with the oil. It is only from use and habit, or comparisons with specimens of known quality, that we can judge of the goodness, either of the drugs themselves, or of their oils.

Most of the volatile oils, indeed, are too hot and pungent to be tasted with safety: and the smell of the subject is so much concentrated in them, that a small variation in this respect is not easily distinguished; but we can readily dilute them to any assignable degree. A drop of the oil may be dissolved in spirit of wine or received on a bit of sugar, and dissolved by that intermedium in water. The quantity of liquor which it thus impregnates with its flavour, or the degree and quality of flavour which it communicates to a certain determinate quantity of liquor, will be the measure of the degree of goodness of the oil.

Volatile or distilled oils are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped. The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom.

Besides, in preparing these distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example. Therefore many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

In distilling fennel, peppermint, spearmint, pennyroyal, and pimento, the liquor which comes over along with the oil is to be preserved for use in the manner directed under the head of distilled waters.

According to these directions, prepare

Ol. Anisi. *A. E. L. D.*	*Oil of Anise.*	From the seeds.
— Chenopodii. *A.*	—— *Wormseed.*	—— seeds.
— Fœniculi. *A. D.*	—— *Fennel.*	—— seeds.
— Gaultheriæ. *A.*	—— *Partridgeberry.*	—— leaves.
— Juniperi. *A. E. L. D.*	—— *Juniper.*	—— berries.
— Lavandulæ. *A.E.L.D.*	—— *Lavender.*	—— flowers.
— Menthæ Pip. *A.E.L.D.*	—— *Peppermint.*	—— herb.
— Menth. Virid. *A.D.L.*	—— *Spearmint.*	—— herb.
— Monardæ. *A.*	—— *Monarda.*	—— herb.
— Origani. *A. E. L. D.*	—— *Marjoram.*	—— herb.
— Pimentæ. *A. E. L. D.*	—— *Pimento.*	—— berries.
— Rorismarini. *A.E.L.D.*	—— *Rosemary.*	—— tops.
— Sassafras. *A. E. D.*	—— *Sassafras.*	—— root, bark, &c.
— Carui. *D. L.*	—— *Caraway.*	—— seeds.
— Sabinæ. *E. D.*	—— *Savine.*	—— leaves.
— Anthemedis. *L. E.*	—— *Chamomile.*	—— flowers.
— Pulegii. *L. D.*	—— *Pennyroyal.*	—— herb, &c.
— Rutæ. *D.*	—— *Rue.*	—— herb.

Medical use.—Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they

differ as much as the subjects from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues of the several subjects reside. Thus, the carminative virtue of the warm seeds, the diuretic of juniper berries, the emmenagogue of savine, the nervine of rosemary, the stomachic of mint, the cordial of aromatics, &c. are supposed to be concentrated in their oils.

There is another remarkable difference in volatile oils, the foundation of which is less obvious, that of the degree of their pungency and heat. These are by no means in proportion, as might be expected, to those of the subject they were drawn from. The oil of cinnamon, for instance, is excessively pungent and fiery; in its undiluted state it is almost caustic; whereas cloves, a spice, which, in substance, is far more pungent than the other, yields an oil which is much less so. This difference seems to depend partly upon the quantity of oil afforded, cinnamon yielding much less than cloves, and consequently having its active matter concentrated into a smaller volume, partly upon a difference in the nature of the active parts themselves; for though volatile oils contain always the specific odour and flavour of their subjects, whether grateful or ungrateful, they do not always contain the whole pungency; this resides frequently in a more fixed matter, and does not rise with the oil. After the distillation of cloves, pepper, and some other spices, a part of their pungency is found to remain behind; a simple tincture of them in alcohol is even more pungent than their pure essential oils.

The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgustful. It has been customary to employ them as correctors for the resinous purgatives; an use to which they do not seem to be well adapted. All the service they can here be of is, to make the resin sit more easily at first on the stomach; far from abating the irritating quality upon which the violence of its operation depends, these pungent oils superadd a fresh stimulus.

Volatile oils are never given alone, on account of their extreme heat and pungency; which in some is so great, that a single drop let fall upon the tongue produces a gangrenous eschar. They are readily imbibed by a piece of dry sugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into an uniform milky liquor. They dissolve likewise in alcohol; the more fragrant in an equal weight; and almost all of them in less than four times their own weight. These solutions may be either taken on sugar, or mixed with syrups, or the like. On mixing them with water, the liquor grows milky, and the oil separates.

The more pungent oils are employed externally against paralytic complaints, numbness, pains, and aches, cold tumours, and in other cases where particular parts require to be heated or stimulated.

The toothach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow tooth.

Oleum Terebinthinæ. *A. D.* *Oil of Turpentine.*

Take of
Common turpentine, ... five pounds;
Water, ... four pints.

Distil the turpentine with the water in a copper alembic. After the distillation of the oil, what remains is yellow resin.

Oleum Terebinthinæ Rectificatum. *L. D. E.*

Rectified Oil of Turpentine.

The rectified oil, which, in many Pharmacopœias, is styled ethereal, is said not to have its specific gravity, smell, taste, or medical qualities, much improved by this process, which is both tedious and accompanied with danger. It must be conducted with very great care; for the vapour, which is apt to escape through the junctures of the vessel, is very inflammable.

Medical use.—The spirit of turpentine, as this essential oil has been styled, is frequently given internally as a diuretic and sudorific; and it has sometimes a considerable effect when taken to the extent of a few drops only. It is now, however, used much more freely, and the strangury and bloody urine formerly dreaded from it are rarely observed. Two, or even three ounces are swallowed without any substance combined with it, for the cure of tænia, and emulsions of oil of turpentine are freely used to act upon the bowels in epilepsy and mania, and in some obstinate rheumatic affections.

Oil of turpentine, melted with as much ointment of yellow resin as is sufficient to give it the consistence of a liniment, constitutes the application to recent burns, so strongly recommended by Mr. Kentish. He first bathes the part with heated oil of turpentine, alcohol, or tincture of camphor, and then covers it up with rags dipped in the liniment, which are to be renewed one at a time, once a day. As the inflammation subsides, less stimulating applications are to be used; and when the secretion of pus commences, the parts are then to be covered with powdered chalk, heated to the temperature of the body. In this way, he assures us, that he cured very many extensive burns in a few weeks, which, under the use of cooling applications, would have required as many months, or would have been altogether incurable.

OLEA EMPYREUMATICA.—*EMPYREUMATIC OILS.*

Empyreumatic oils agree in many particulars with the volatile oils already treated of, but they also differ from them in several important circumstances. The latter exist ready formed in the aromatic substances, from which they are obtained, and are only separated from the fixed principles by the action of a heat not exceeding that of boiling water. The former, on the contrary, are always formed by the action of a degree of heat considerably higher than that of boiling water, and are the product of decomposition, and a new arrangement of the elementary principles of substances, containing at least oxygen, hydrogen, and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they do not differ very remarkably from the volatile oils, and are principally distinguished from them by their unpleasant pungent empyreumatic smell and rough bitterish taste. They are also more apt to spoil by the contact of the air, and the oftener they are re-distilled they become more limpid, less coloured, and more soluble in alcohol; whereas the essential oils, by repeated distillations, become thicker and less soluble in alcohol.

Their action on the body is exceedingly stimulant and heating.

OLEUM SUCCINI. *A. L. D.* *Oil of Amber.*

Take of

Amber, any quantity, reduced to powder, with an equal weight of clean sand. Mix together.

Put them into a glass retort, and distil from them in a sand bath, with a gradually increased fire, an acid liquor, oil, and salt impregnated with oil.

Oleum Succini Purissimum. *E.*

Oleum Succini Rectificatum. *L. D.*

Purified (Rectified) Oil of Amber.

Distil oil of amber in a glass retort with six times its quantity of water till two thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and keep it for use in close shut vessels.

The rectified oil has a strong bituminous smell, and a pungent acrid taste. Given in a dose of ten or twelve drops, it heats, stimulates, and promotes the fluid secretions: it is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytic limbs, and rheumatic pains.

OLEUM SUCCINI OXYDATUM. *A.* *Oxydated Oil of Amber.*

MOSCHUS FACTITIUS. *Artificial Musk.*

Take of
Oil of amber, . . . one fluid drachm;
Nitric acid, . . . three and a half fluid drachms.

Put the oil of amber into a glass vessel, and gradually drop the acid into it, at the same time stirring the mixture with a glass rod. Let it stand for thirty-six hours, then separate the supernatant resinous matter from the acid fluid beneath, and wash it repeatedly, first with cold, and lastly with hot water, till the acid taste disappears.

The preparation of this article is thus directed in Paris's Pharmacologia, p. 450.

Artificial Musk, strongly resembling the real, may be formed by digesting half a fluid ounce of *nitric acid* for ten days upon one ounce of fetid animal oil obtained by distillation; to this is to be next gradually added one pint of *rectified spirit,* and the whole is then to be left to digest for one month.

OLEUM CORNU CERVINI RECTIFICATUM. *D.* OLEUM ANIMALE.

Rectified Oil of Hartshorn.

Take of
The oil which ascends in the distillation of the volatile liquor of hartshorn, . . . three pounds;
Water, ... six pounds.

Distil a pound and a half.

Animal oil, thus rectified, is thin and limpid, of a subtle, penetrating, not disagreeable, smell and taste.

Medical use.—It is strongly recommended as an anodyne and antispasmodic in doses of from 15 to 30 drops. Hoffman reports, that it procures a calm and sweet sleep, which continues often for 20 hours, without being followed by any languor or debility, but rather leaving the patient more alert and cheerful than before: that it procures likewise a gentle sweat, without increasing the heat of the blood; that given to 20 drops or more, on an empty stomach, six hours before the accession of an intermittent fever, it frequently removes the disorder; and that it is likewise a very general remedy in inveterate and chronical epilepsies, and in convulsive motions, especially if given before the usual time of the attack, and preceded by proper evacuations. How far empyreumatic oils possess the virtues that have been ascribed to them, has not yet been sufficiently determined by experience; the tediousness and trouble of the rectification having prevented their coming into general use, or being often made. They are liable also to more material inconvenience in

regard to their medicinal use, namely, precariousness in their quality; for how perfectly soever they may be rectified, they gradually lose, in keeping, the qualities they had received from that process, and return more and more towards their original fetid state.

OLEAGINOSA.—*OILY PREPARATIONS.*

Oleum Ammoniatum. *E.*

Linimentum Ammoniæ. *A. D.* (Fortius. *L.*) Linimentum Volatile.

Ammoniated Oil. Liniment of Ammonia. Volatile Liniment.

Take of
Olive oil, ... two ounces;
Water of ammonia, . . . two drachms.
Mix them together.

The London College orders a stronger liniment of ammonia, of one ounce of water of pure ammonia, and two ounces of olive oil.
The American Pharmacopœia orders it to be made of equal parts.

Linimentum Ammoniæ Sub-Carbonatis. *L.*

Liniment of Sub-Carbonat of Ammonia.

Take of
Solution of sub-carbonat of ammonia, . . . one fluid ounce;
Olive oil, ... three fluid ounces.
Shake them together till they are mixed.

The most commonly adopted generic name for the combination of oil with alkalies is soap, and the species are distinguished by the addition of that of the alkalies they contain. On these principles, volatile liniment should be called soap of ammonia, as hard soap is soap of soda, and soft soap, soap of potass.

Medical use.—They are frequently used externally as stimulants and rubefacients. In inflammatory sore throats, a piece of flannel moistened with these soaps, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body is put into a sweat, which, after bleeding, either carries off, or lessens the inflammation. When too strong, or too liberally applied, they sometimes occasion inflammations, and even blisters. Where the skin cannot bear their acrimony, a larger proportion of oil may be used.

This preparation is sometimes used internally, made into a mixture with syrup and some aromatic water. A drachm or two taken in this manner three or four times a day, is a powerful remedy in some kinds of catarrh and sore throat.

Oleum Lini cum Calce. *E.* Linimentum (Aquæ) Calcis. *D.*

Liniment of Lime Water. Lime Liniment.

Take of
 Linseed oil,
 Lime water, of each, equal parts.
Mix them.

This liniment is extremely useful in cases of scalds or burns, being singularly efficacious in preventing, if applied in time, the inflammation subsequent to burns or scalds; or even in removing it, after it has come on.

It is also a species of soap, and might be called soap of lime, although it probably contains a great excess of oil.

Oleum Camphoratum. *E. D.* *Camphorated Oil.*

Take of
 Olive oil, . . . two ounces;
 Camphor, . . . half an ounce.
Mix them so that the camphor may be dissolved.

This is a simple solution of camphor in fixed oil, and is an excellent application to local pains from whatever cause, and to glandular swellings.

Oleum Sulphuratum. *E. L.*

Sulphureted Oil. Balsam of Sulphur.

Take of
 Olive oil, ... eight ounces;
 Sublimed sulphur, . . . one ounce.
Boil them together in a large iron pot, stirring them continually, till they unite.

Göttling directs the oil to be treated in an iron pot, and the sulphur to be gradually added, while the solution is promoted by constant stirring with an iron spatula. The pot must be sufficiently large, as the mixture swells and boils up very much; and as it is apt to catch fire, a lid should be at hand to extinguish it by covering up the pot.

Medical use.—Sulphureted oil was formerly strongly recommended in coughs, consumptions, and other disorders of the breast and lungs: but the reputation which it had in these cases, does not appear to have been derived from any fair trial or experience. It is manifestly hot, acrimonious, and irritating; and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose of it is from ten to

forty drops. It is employed externally for cleansing and healing foul running ulcers; and Boerhaave conjectures, that its use in these cases gave occasion to the virtues ascribed to it when taken internally.

ONISCUS ASELLUS. Millepædæ. *D.*

Millepes. Slaters.

These insects are found in cellars, under stones, and in cold moist places; in warm countries they are rarely met with. They have a faint, disagreeable smell, and a somewhat pungent, sweetish, nauseous taste.

Neumann got from 480 parts 95 watery, and 10 alcoholic extract; and inversely, 52 alcoholic, and 45 watery. Nothing rose in distillation with either.

Their medical virtues have been very much over-rated.

The millipeds are prepared by enclosing them in a thin canvass cloth, and suspending it over hot proof spirit in a close vessel, till they be killed by the steam, and rendered friable.

This barbarous practice is now nearly exploded.

ORCHIS MASCULA ET MORIO. Salep. *A.*

Salep. The Fecula of the Root.

The root of this plant, by maceration in water and beating, affords the fecula known by the name of salep. Its qualities and virtues are similar to those of sago. Both of these when boiled in milk or water, with the addition of sugar and wine, form a nutritious jelly, prescribed in diarrhœa and dysentery as a demulcent, and in convalescence as a nutritious article of diet, easy of digestion.

Dr. Cutler describes one species of orchis, the production of our own soil, thus:

Lady's Plume. *Female-handed Orchis.* Blossoms in large spikes; white or purplish, or flesh-coloured. In wet meadows. August.

ORIGANUM VULGARE. *L. D.* ORIGANUM. *A.* (*Secondary.*)

Marjoram. Common Marjoram. The Herb.

The United States' Pharmacopœia has made a mistake in respect to the article origanum, which will doubtless be rectified on a fu-

ture occasion. It has origanum in both the lists of the Materia Medica, in the primary it is called wild marjoram, in the secondary list, simply marjoram; which is meant particularly, we cannot say.

The Origanum is a perennial plant, and is met with upon dry chalky hills, and in gravelly soils, in several parts of Britain. It has an agreeable smell, and a pungent taste, warmer than that of the garden marjoram, and much resembling thyme, with which it seems to agree in virtue. An essential oil distilled from it, is kept in the shops, and is very acrid.

Origanum Marjorana. *E. D.* *Sweet Marjoram.* *The Plant.*

Sweet marjoram is an annual plant, which grows wild in Portugal, but is cultivated in our gardens, principally for culinary purposes. It is a moderately warm aromatic, yielding its virtues both to aqueous and spirituous liquors by infusion, and to water in distillation.

OSTREA EDULIS. *L.* *Oyster.* *The Shells.*

The oyster is a very nutritious article of diet, and in some diseases not only admissible, but even advantageous. Their shells, which are officinal, are composed, like all the mother-of-pearl shells, of alternate layers of carbonat of lime, and a thin membranaceous substance, which exactly resembles coagulated albumen in all its properties. By burning, the membrane is destroyed, and they are converted into lime, which, although very pure, possesses no advantage over that of the mineral kingdom.

OSSA. *E.* *Bones.*

Recent bones consist of about half their weight of phosphat of lime, one-third of their weight of cartilage or gelatin, and one-tenth of carbonat of lime. They also contain a little fluat of lime, phosphat of magnesia, soda, and muriat of soda. M. Darcet has shown how much nourishment can be extracted from them, by removing the earthy salts, by means of muriatic acid. But in pharmacy, bones are only used for the preparation of phosphat of lime, by burning them, and of phosphat of soda, and phosphat of antimony and lime, by decomposition.

OROBANCHE VIRGINIANA.

Virginia Broom-rape. Beech-drops. Cancer-root.

This plant is common in many parts. It is astringent, and a peculiar and extremely nauseous bitter. It is most powerful when recent. It has been used in dysentery, and externally to obstinate ulcers; and is supposed to have formed a part of the late Dr. Martin's cancer powder.*

OXALIS ACETOSELLA. *L.*

Common Wood-sorrel. The Leaves.

This is a small perennial plant, which grows wild in woods, and shady hedges. The leaves contain a considerable quantity of super-oxalat of potass, and have an extremely pleasant acid taste. They possess the same powers with the vegetable acids in general, and may be given in infusion, or beaten with sugar into a conserve, or boiled with milk to form an acid whey. The super-oxalat of potass is extracted in large quantities from them, and sold under the name of *Essential salt of Lemons.*

Twenty pounds of the fresh leaves yielded to Neumann six pounds of juice, from which he got two ounces two drachms and a scruple of salt, besides two ounces and six drachms of an impure saline mass.

Oxalic acid is obtained in quadrangular crystals, transparent and colourless, of a very acid taste. They are soluble in their own weight of water at 212°, and in about two waters at 65°. Boiling alcohol dissolves somewhat more than half its weight, and at an ordinary temperature, a little more than one third. It is soluble in the muriatic and acetous acids. It is decomposed by heat, sulphuric acid, and nitric acid. According to Fourcroy, it consists of 77 oxygen, 13 carbon, and 10 hydrogen.

Oxalats are decomposed by heat; form a white precipitate with lime water, which is soluble in acetous acid after being exposed to a red heat. The earthy oxalats are very sparingly soluble in water; the alkaline oxalats are capable of combining with excess of acid, and become less soluble.

Oxalic acid is highly poisonous, and has proved fatal in several instances, by being taken accidentally for salts, or cremor tartar.

* Barton's Collections, Part II. p. 6.

P.

PANAX QUINQUEFOLIUM. *Ginseng. The Root.*

This is a perennial plant, which grows in Tartary and North America. The root is about the thickness of the little finger; an inch or two in length, often dividing into two branches; of a whitish-yellow colour; wrinkled on the surface; of a compact, almost horny texture; when broken, exhibiting a resinous circle in the middle, of a reddish colour. It has no smell, but a very sweet taste, combined with a slight degree of aromatic bitterness.

The Chinese, probably on account of its scarcity, have a very extraordinary opinion of the virtues of this root, so that it sells for many times its weight in silver. The Americans, on the contrary, disregard it, because it is found plentifully in their woods. In fact, it is a gentle and agreeable stimulant.

*** The powdered root answers well as a substitute in making pills, for the liquorice root; and from a few imperfect trials, I am disposed to think its extract might equally supply the place of the extract of liquorice.

PAPAVER.—*POPPY.*

Polyandria Monogynia.—Nat. ord. *Rhœades.*

PAPAVER RHOEAS. *L. D.*

Corn-rose, or Red Poppy. The Flower.

This species of poppy is annual, and very common in the corn fields of Britain. The petals give out a fine red colour when infused, and are supposed to possess slightly anodyne properties.

Papaver Somniferum. *A. E. L. D.*

White Poppy. The Heads. The Concrete Juice called Opium.

The white poppy is also annual, and is sometimes found wild in Great Britain, but it is probably originally a native of the warmer parts of Asia. It is frequently cultivated for the beauty of the varieties of its flowers, and for its seeds. Some attempts have been made to obtain opium from its capsules; and Mr. Ball received a premium from the Society for encouraging the Arts, for specimens of British opium, in no respect inferior to the best eastern opium. But we apprehend that the climate of Great Britain is an insuperable obstacle to its becoming a profitable branch of agriculture.*

* It has been procured in the United States, where this objection will not prevail. See Philadelphia Medical Museum, Vol. II. p. 428.

The leaves, stalks, and capsules of the poppy, abound with a milky juice, which may be collected in considerable quantity, by slightly wounding them when almost ripe: this juice, exposed for a few days to the air, thickens into a stiff tenacious mass, which in fact is opium. It is then worked up into masses, and covered with poppy or tobacco leaves. By decoction and expression this juice is partially extracted, together with a considerable quantity of mucilage. The liquor strongly pressed out, suffered to settle, clarified with whites of eggs, and evaporated to a due consistence, yields about one fifth, or one sixth the weight of the heads, of extract. This possesses the virtues of opium in a very inferior degree; but it does not come to Great Britain unless when used to adulterate the genuine opium. A strong decoction of the dried heads, mixed with as much sugar as is sufficient to reduce it into the consistence of a syrup, becomes fit for keeping in a liquid form; and is the only officinal preparation of the poppy. It is, however, a very unequal preparation, as the real quantity of opium it contains is very uncertain, and by no means equal to syrup, to which a certain quantity of solution of opium is added.

The seeds of the poppy are simply emulsive, and contain none of the narcotic principle. They yield a considerable quantity of fixed oil by expression.

OPIUM. *A. E. L. D.*

Opium. The Concrete Juice of the Capsules before they are ripe.

Opium is the inspissated juice of the poppy. In the evening several superficial longitudinal incisions are made in the capsules, when they are almost ripe, with a knife having from three to five blades. The juice which exudes during the night, next day after it has been thickened, by the heat of the sun, is collected by means of iron scrapers, and put in an earthen pot. The operation is repeated as long as the heads furnish juice in sufficient quantity, and the opium is worked into masses with a wooden spatula, in the heat of the sun, until it acquires the due degree of thickness, when the masses are covered with poppy or tobacco leaves.

Two kinds of opium are found in commerce, distinguished by the names of Turkey and East-India opium.

Turkey opium is a solid compact substance, possessing a considerable degree of tenacity; when broken, having a shining fracture and uniform appearance; of a dark-brown colour; when moistened, marking on paper a light-brown interrupted streak, and becoming brown when reduced to powder; scarcely colouring the saliva when chewed, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth; and having a peculiar heavy disagreeable smell. The best kind is in flat pieces, and besides the large leaves in which it is enveloped, is covered with the reddish capsules of a species of rumex, probably used in packing it. The round masses, which have none of the capsules adhering to them,

are evidently inferior in quality. Opium is bad if it be soft, or friable, mixed with any impurities, have an intensely dark or blackish colour, a weak or empyreumatic smell, a sweetish taste, or draw upon paper a brown continuous streak.

East-India opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and its smell rather empyreumatic. It is considerably cheaper than Turkish opium, and is supposed to be of only half the strength. One-eighth of the weight of the cakes is allowed for the enormous quantity of leaves with which they are enveloped. In the East Indies, when opium is not good enough to bring a certain price, it is destroyed under the inspection of public officers.

Opium is not fusible, but is softened even by the heat of the fingers. It is highly inflammable. It is partially soluble both in alcohol and in water. Neumann got from 1920 parts of opium, 1520 alcoholic, and afterwards 80 watery extract, 320 remaining undissolved; and inversely 1280 watery, and 200 alcoholic extract, the residuum being 440.

The solutions of opium are transparent, and have a brown or vinous colour. The watery solution is not decomposed by alcohol. A small quantity of matter, which, as far as experiments go, is neither fusible nor remarkably inflammable, is separated from the alcoholic solution by water. The watery solution of opium, and the alcoholic, after it has been precipitated by water, does not redden vegetable blues, is not precipitated by acids or alkalies, but is precipitated copiously by carbonat of potass, muriat and super-nitrat of mercury, oxymuriat of tin, sulphat of copper, sulphat of zinc, acetat of lead, nitrat of silver, and red sulphat of iron. The precipitate in the last case was of a dirty brown colour, not resembling those by alkaline or astringent substances. The solutions of opium, especially the watery, are also copiously precipitated by infusion of galls. This precipitate seems to resemble that produced by cinchonin, and to be different from that produced by gelatin.

The narcotic virtues of opium are imparted by distillation to alcohol and to water, and they are diminished, or entirely dissipated, by long boiling, roasting, or great age. The part of opium which is not soluble either in water or in alcohol, is albumen, according to Gren; caoutchouc, according to Bucholz; a virulent glutinous substance, according to Josse; and Proust says it contains wax. From experiments made some years ago, Dr. Duncan concluded that it was perfectly similar to the gluten of wheat flour, or fibrine. Long ago it was proposed to separate the resinous parts of opium by the same process that fibrine of wheat flour is obtained. The fact is, that if Turkey opium be kneaded in a large quantity of water, the soluble parts are removed, and there remains in the hand an adhesive plastic mass, of a paler colour, not fusible, but becoming ductile when immersed in hot water, inflammable, imparting some colour to alcohol, but not soluble in it. East-India opium, treated in the same

way, is entirely dissolved or diffused in the water, and leaves no plastic mass in the hand.

Upon the whole, it appears, that the active constituent of opium, though not perfectly understood, is of a volatile nature, but sometimes fixed by its combination with the other constituents; that it is soluble both in water and in alcohol; that it is dissipated in the process recommended for purifying opium by solution and evaporation; and that the attempts made by some pharmaceutists, to obtain a preparation of opium, which should possess only its sedative, without its narcotic effects, only succeeded so far as they diminished its activity.

By evaporating a watery solution of opium, to the consistence of a syrup, Derosne obtained a precipitate, which was increased by diluting it with water. He dissolved this in hot alcohol, from which it again separated on cooling. When purified by repeated solutions, it crystallized in rectangular prisms, with rhomboidal bases, had no taste or smell, was insoluble in cold water, and soluble in 400 parts of boiling water, did not affect vegetable blues, was soluble in 24 parts boiling alcohol, and 110 cold; soluble in hot ether and volatile oils, and separated from them as they cooled; very soluble in all acids, and highly narcotic. These observations are curious, and the experiments deserve to be repeated.

Medical use.—The action of opium on the living system has been the subject of the keenest controversy. Some have asserted that it is a direct sedative, and that it produces no stimulant effects whatever; while others have asserted as strongly, that it is a powerful, and highly diffusible stimulus, and that the sedative effects, which it undeniably produces, are merely the consequence of the previous excitement. The truth appears to be, that opium is capable of producing a certain degree of excitement, while the sedative effects which always succeed, are incomparably greater than could be produced by the preceding excitement. The stimulant effects are most apparent from small doses. These increase the energy of the mind, the frequency of the pulse, and the heat of the body, excite thirst, render the mouth dry and parched, and diminish all the secretions and excretions, except the cuticular discharge, which they increase. These effects are succeeded by languor and lassitude. In larger doses, the stimulant effects are not so apparent; but the excitability is remarkably diminished, and confusion of head, vertigo, and sleep, are produced. In excessive doses it proves a violent narcotic poison, producing headach, vertigo, delirium, and convulsions, accompanied with a very slow pulse, stertorous breathing, and a remarkable degree of insensibility or stupor, terminated by apoplectic death. In one case, where Dr. Duncan inspected the body after death, the inner membrane of the stomach was remarkably corrugated, and with some inflammation; but as large doses of sulphat of zinc, and flour of mustard had been also taken, no inference can be drawn from these appearances. The bad effects of an over-dose of opium are often prevented by the occurrence of vomiting, and they are best counteracted by making the patients drink freely of acids and cof-

fee, and chiefly by not permitting him to yield to his desire of sleeping. By habit, the effects of opium on the body are remarkably diminished. There have been instances of four grains proving fatal to adults, while others have been known to consume as many drachms daily. The habitual use of opium produces the same effects with habitual dram-drinking; tremors, paralysis, stupidity, and general emaciation: and, like it, can scarcely ever be relinquished.

In disease, opium is chiefly employed to mitigate pain, diminish morbid sensibility, procure sleep, allay inordinate actions, and to check diarrhœas, and other excessive discharges. It is contra-indicated in gastric affections, plethora, a highly inflammatory state of the body, and determination of the blood to particular viscera.

In intermittents, it is said to have been used with good effect in every stage. Given even in the hot stage, it has been observed to allay the heat, thirst, headach, and delirium, to induce sweat and sleep, to cure the disease with less bark, and without leaving abdominal obstructions or dropsy.

In fevers of the typhoid type, accompanied with watchfulness or diarrhœa, it is extremely useful; but when not indicated by particular symptoms, it does harm, by augmenting thirst, and producing constipation.

Especially when combined with calomel, it has lately been much employed in inflammations from local causes, such as wounds, fractures, burns, absorption of morbid poisons, as in swelled testicle, &c. and even in active inflammations, accompanied with watchfulness, pain, and spasm, after blood-letting.

In small-pox, when the convulsions before eruption are frequent and considerable, or when the accompanying fever is of the typhoid type, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of suppuration, to promote the ptyalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independently of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhœa, the disease itself generally carries off any offending acrimony, and then, or after purgatives, opium is used with great effect. Even in the worst symptomatic cases, it seldom fails to alleviate.

In cholera and pyrosis, it is almost the only thing trusted to.

In colic, it is employed with laxatives; and often prevents ileus and inflammation, by relieving the spasm. Even in ileus it is sometimes used to allay the vomiting, the spasms, and the pain.

It is given to allay the pain, and favour the descent of calculi, and to give relief in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus; affords relief to the various spasmodic symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is only useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury, for it possesses no power of overcoming the venereal virus.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after-pains and excessive flooding.

The administration of opium to the unaccustomed, is sometimes very difficult. The requisite quantity is wonderfully different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dose that might prove fatal in cholera or colic, would not be perceptible in many cases of tetanus or mania.* When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences; but sometimes a small dose has the desired effect, while a larger one gives rise to vertigo and delirium, and with some constitutions it does not agree in any dose or form. Its stimulant effects are most certainly produced by the repetition of small doses; its anodyne by the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

Externally, opium is used to diminish pain, and to remove spasmodic affections. It is found particularly serviceable in chronic ophthalmia, when accompanied with morbidly increased sensibility.

Opium may be exhibited,

1. In substance, made up in the form of a pill, lozenge or electuary. Its most efficient form.
2. Dissolved in diluted alcohol, or white wine.
3. Dissolved in water, or watery fluids. Very perishable.
4. Dried and reduced to powder.†
5. Combined with acetic acid, as in the black drop.

It is often given in combination with aromatics, astringents, emetics, bitters, camphor, soap, distilled waters, mucilage, syrups, acids, carbonat of ammonia, ether, acetat of lead, tartrat of antimony and potass, and unctuous substances. Some of these are certainly unchemical mixtures, for by experiment we find that the solutions of opium are copiously precipitated by astringents, the alkaline carbonats, and all the metallic salts.

The subject of opium is of a nature so interesting, that we shall be excused, at the risk of repetition, for introducing the following from Dr. Paris's Pharmacologia, p. 462.

"*Chemical composition.* Resin, gum, bitter extractive, sulphat of lime, gluten, and a peculiar alkaline body, to which the narcotic virtues of opium are owing, and to which the appropriate name of *Morphia* has been assigned; and it appears moreover that this new

* In the life of the celebrated John Baptiste Michel Bucquet, a French physician, we are told that "he was known to take in one day two pounds of ether and 100 grains of opium."—General Biography, second edition, p. 347. 4to.

† It is difficult to pulverize opium, unless advantage is taken of the cold of winter, when it is readily accomplished.

alkaline body exists in combination with an unknown acid, which has therefore been denominated the *Meconic acid;* so that the narcotic principle of opium is *Morphia* in the state of a *meconiat,* or perhaps of a *super-meconiat.*

"For these important facts, we are indebted to the successive labours of Derosne,* Sertuerner, and Robiquet. And the French codex contains in its appendix, formulæ for the preparation of morphia according to the directions of these two latter chemists.†

"*Characters of Morphia.* When pure, it crystallizes in very fine, transparent, truncated pyramids, the bases of which are either squares or rectangles, occasionally united base to base, and thereby forming octohedra. It is sparingly soluble in boiling water, but dissolves abundantly in heated alcohol and ether, and the solutions are intensely bitter. It has all the characters of an alkali; affecting test papers, uniting with acids, and forming neutral salts, and decomposing the compounds of acids with metallic oxyds. It unites with sulphur by means of heat, but the combination is decomposed at the same instant; it is incapable of forming soap with an oxydized oil. It fuses at a moderate temperature, when it resembles melted sulphur, and like that substance, crystallizes on cooling; it is decomposed by distillation, yielding carbonat of ammonia, oil, and a black resinous residue, with a peculiar smell; when heated in contact with air, it inflames rapidly; the voltaic pile exerts but little action upon it, yet, when mixed with a globule of mercury, the latter appears to become increased in bulk, and to change consistence. Its habitudes with different bodies have not hitherto been sufficiently investigated, but they are highly important, in as much as they will explain the operation of those various medicinal compounds, into which opium

* *Annales de Chimie*, vol. 45. The Salt of Derosne, however, as the experiments of Robiquet seem to show, is not, as Sertuerner supposed, a *meconiat of morphia*, but another acid, characterized by a different train of properties, and which may be separated from opium by a somewhat circuitous process. Farther experiments are required upon this subject.

† Robiquet's *Process.* Three hundred parts of pure opium are to be macerated during five days, in one thousand parts of common water; to the filtered solution, fifteen parts of perfectly pure magnesia, (carefully avoiding the *carbonat,*) are to be added; boil this mixture for ten minutes, and separate the sediment by a filter, washing it with cold water, until the water passes off clear; after which, treat it alternately with hot and cold alcohol, (12, 22, Bé.) as long as the menstruum takes up any colouring matter; the residue is then to be treated with boiling alcohol (22, 32, Bé.) for a few minutes. The solution, on cooling, will deposite crystals of *Morphia.*

Rationale of the Process. A soluble *Meconiat of Magnesia* is thus formed, whilst the sediment consists of *Morphia* in a state of mixture, with the excess of magnesia; the boiling alcohol with which this residuum is treated, exerts no action upon the magnesia, but dissolves the *Morphia*, and on cooling surrenders it in a crystalline form. A repetition of the treatment with boiling alcohol, will procure a fresh crop of crystals, and the process should be continued until they cease to appear.

Sertuerner's *Method.* It differs from the preceding, in substituting ammonia for magnesia, and in adding to the sediment, separated as before mentioned, as much sulphuric acid as is sufficient to convert the *Morphia* into a sulphat, which is subsequently decomposed by a farther addition of ammonia; the precipitate thus produced is then dissolved in boiling alcohol, which, on cooling, surrenders the *Morphia* in a state of crystalline purity. It appears, however, that the *Morphia* produced by this latter method, is less abundant and more impure and coloured, than that which is furnished by the process of Robiquet.

enters as a principal ingredient. Morphia acts on the animal body as a most powerful agent, three half grains taken in succession, with intervals of half an hour, by the same person, produced violent vomiting and alarming faintings, and yet its comparative insolubility must materially diminish its potency; hence, under certain circumstances, vegetable acids render narcotic extracts more efficient. The following history of its saline compounds may be useful.

" The *Carbonat* crystallizes in short prisms.

" The *Acetat*, in soft prisms, very soluble, and extremely active.

" The *Sulphat*, in arborescent crystals, very soluble.

" The *Muriat*, in plumose crystals, much less soluble; when evaporated, it concretes into a shining white plumose mass on cooling.

" The *Nitrats*, in prisms grouped together.

" The *Meconiat*, in oblique prisms, sparingly soluble.

" The *Tartrat* in prisms.

" Morphia is separated from the above combinations by ammonia.

" Morphia is very soluble in olive oil, and according to the experiments of M. Majendie, the compound acts with great intensity; with extractive matter, morphia forms a compound which is almost insoluble in water, but very soluble in acids.

" The *Meconic acid*, when separated from the residuum of the magnesian salt, as described above, does not appear to possess any medicinal activity. Its distinguishing *chemical* character is, that it produces an intensely red colour in solutions of iron oxydized *ad maximum*.

" *East-India opium* is an inferior species; it differs from *Turkey opium*, in its *texture* being less compact, and much softer; its *colour* darker; its narcotic *odour* fainter, but combined with a strong empyreuma, and in its *taste* being more bitter, but less acrimonious. According to the experiments of Mr. A. T. Thomson, *Turkey opium* contains three times more morphia than the *East-India* variety. This latter, when triturated with water, is taken up without any residuum, hence it contains no gluten, but the sulphat of lime is more abundant, as appears from the relative proportion of precipitate produced by oxalic acid. The solution of the acetat of barytes, whilst it occasions no disturbance in the solutions of the Turkey variety, produces a copious precipitate with the East-Indian."

" Dr. Porter, of Bristol, has introduced to our notice, a solution of opium in citric acid; his formula* for its preparation is subjoined, because I am of opinion, that it merits the attention of the practitioner; I have lately submitted it to the test of experience, and it certainly possesses the merit of a powerful anodyne, operating with less disturbance than the more ordinary forms of this substance. I also take this opportunity of stating, that the *pyroligneous acid* manufactured by Beaufoy, was used as a menstruum, and the effect of the solution was similar to that of Dr. Porter."

* *Liquor Morphii Citratis.* ℞ Opii Crudi Optimi, uncias quatuor; Acidi Citrici, (Cryst.) uncias duas; semel in mortario lapideo contunde, dein aquæ distillatæ bullientis oj affunde; et intime misceantur; macera per horas viginti quatuor; per chartam bibulosam cola.

"*Adulterations.* The *Turkey opium,* when good, is covered with leaves, and the reddish capsules of some species of *rumex;* the inferior kinds have none of these capsules adhering to them. It is frequently adulterated with the extract of liquorice; it should be regarded as bad when it is very soft or friable, of an intensely black colour, or mixed with many impurities, or when it has a sweetish taste, or marks paper with a brown continuous streak, when drawn across it. It frequently happens, that in cutting a mass of opium, bullets and stones have been found imbedded in it, a fraud which is committed by the Turks, from which the retailer alone suffers."

A fraudulent composition under the name of *Persian opium,* was lately vended in the United States. The circumstances connected with it were published in the newspapers, and in the Eclectic Repertory of this city, by Messrs. Jackson, Lowber, and Wiltberger.

In the Journal de Physiologie Expérimentale, for January, 1821, Mr. Robiquet has given a new mode of preparing the extract of opium. In relation to this, the following is extracted from the Medical Intelligencer for February, 1821.

"The nauseating principle of opium, says the author, has but a small share in the effects which that substance produces on the animal economy. It is now a well established fact, that those effects are the result of properties peculiar to the two principles recently discovered in opium, the 'narcotine' and the 'morphine.'

"It results from Dr. Majendie's experiments, that the former acts on the animal system as a stimulant, or rather as an irritating substance; while the latter is the real anodyne, and that which induces calm sleep. The presence of two such opposite principles in opium, is, by Dr. Majendie, considered as the cause of the variable effects which that drug is known often to produce.

"The 'narcotine' is the salt which Derosne discovered some years ago, and which led to the subsequent and more recent detection of 'morphium;' and if that principle be the obnoxious one, which it is desirable to separate from the common extract of opium, any method of accomplishing that object in an effectual manner, will be received with gratitude. This method M. Robiquet has the merit of suggesting.

"'Make a solution of opium in cold water, in the same way as if the aqueous extract were to be prepared. Filter and evaporate to the consistence of a thick syrup, which is to be treated in appropriate vessels, by rectified æther, taking care to shake the mixture repeatedly before decanting the æthereal tincture. The latter is then distilled, to separate the æther, and the operation repeated by adding fresh æther, and re-distilling as long as any crystals of 'narcotine' are obtained by the distillation. The solution of opium is then evaporated to the consistence of extract, which is preserved for use.'"

Opium Purificatum. *D.* *Purified Opium.*

Take of
Opium, cut into small pieces, . . . one pound;
Proof spirit of wine, ... twelve pints.

Digest with a gentle heat, stirring now and then till the opium be dissolved; filter the liquor through paper, and distil in a retort until the spirit be separated: Pour out the liquor which remains, and evaporate until the extract acquires a proper thickness.

Purified opium must be kept in two forms; one *soft*, proper for forming into pills; the other *hard*, capable of being reduced into powder.

As the changes which opium and aloes undergo by solution, and subsequent evaporation, have never been ascertained by careful and satisfactory experiments, well-selected pieces of these substances are to be preferred to the preparations in which they are supposed to be purified. As a farther proof of the superiority of good opium over all its preparations, it may be remarked, that the latter, however well prepared, soon become mouldy, the former never does.

Mr. Phillips, however, prefers the preparing of an extract of opium, by first submitting it to the action of boiling water, as long as any portion of it continues to be dissolved, and then digesting the residuum in rectified spirit, and mixing the watery and alcoholic extracts thus obtained. He found, that 72 parts of opium, dried by steam till it became pulverizable, yielded to cold water 30 parts, then to boiling water 9, and, lastly, to alcohol 7. The first solution or cold infusion was of a deep brownish-red colour, remained transparent, and smelt strongly of opium; the second or decoction was of a pale brown colour, deposited on cooling the greater part of what had been dissolved, and had no smell of opium; and the third or tincture very much resembled common tincture of opium, and furnished, on the addition of water, an abundant yellowish-white precipitate. Dr. Powell also says, that proof-spirit by heat dissolves 9-12ths of opium; and water, although heated, only 5-12ths.

PASTINACA OPOPONAX. *L.* *Opoponax. A Gum-resin.*

This plant is perennial, and grows wild in the south of Europe; but the gum-resin, which is said to be obtained by wounding the stalk or root, is brought from the Levant and East-Indies, sometimes in round drops or tears, but more commonly in irregular lumps, of a reddish-yellow colour on the outside with specks of white, inwardly of a paler colour, and frequently variegated with large white pieces. It has a peculiar strong smell, and a bitter, acrid, somewhat nauseous taste.

Neumann got from 480 parts, 166 alcoholic, and afterwards 180 watery extract, and inversely 226 watery, and 60 alcoholic. Both the water and alcohol distilled from it were impregnated with its fla-

vour. It forms a milky solution with water, and yields a little essential oil on distillation. It is supposed to be emmenagogue, but is rarely used.

PHASIANUS GALLUS. *L.*

The Dung-hill Fowl. The Egg and Shell.

From what country this useful bird originally came, is not ascertained. It is now domesticated almost every where, and furnishes one of the most wholesome and delicate articles of food.

The egg only is officinal. The shell consists principally of carbonat of lime, with a small quantity of phosphat of lime and animal matter. When burnt, the animal matter and carbonic acid are destroyed, and we obtain a lime, mixed with a little phosphat of lime.

The contents of the egg consist of two substances, the white, and the yelk. The white is albumen,* combined with a little soda and sulphur. The yelk is also albuminous, but contains also a bland oil, and some colouring matter. The latter is sometimes used in pharmacy for suspending oily and resinous substances in water. The former is used for clarification.

PETROSELINUM. *A.* (*Secondary.*) *Parsley. The Plant.*

The most that can be said of this, is, that it is useful in cookery, and that the roots, &c. boiled in water, are presumed to afford it diuretic properties.

PHOSPHORUS. *A.* *Phosphorus.*

Phosphorus is a semi-transparent solid, slightly brilliant, and of a waxy consistence; specific gravity 1.770; taste in some degree

* Albumen is a brittle, transparent substance, of a pale yellow colour, and glutinous taste, without smell, readily soluble in cold water, insoluble in boiling water, but softened and rendered opaque and white when thrown into it; insoluble, and retaining its transparency in alcohol; swelling; becoming brown and decrepitating when suddenly exposed to heat. It generally exists in the form of a viscid, transparent fluid, having little taste or smell, and readily soluble in cold water. When exposed to a temperature of 165°, it coagulates into a white, opaque mass, of considerable consistency; it is also coagulated by alcohol and acids. Albumen forms with tannin a yellow precipitate, insoluble in water. *Coagulated albumen* is not soluble either in cold or in boiling water. It is soluble, but with decomposition, in the alkalies and alkaline earths. It is also soluble in the acids, greatly diluted, but may be precipitated from them by tannin. When slowly dried, it becomes brittle, transparent, and of a yellow colour, resembling amber. When decomposed by nitric acid or heat, it is found to contain more nitrogen than gelatin does. White of egg consists of albumen, combined with a very little soda, sulphur, and phosphat of lime. Albumen also forms a large proportion of the serum of the blood, and is found in the sap of vegetables. It is highly nutritious.

acrid and disagreeable; smell alliaceous. It is brittle under 32°; its fracture is vitreous, brilliant, and sometimes lamellated; above 32° it softens a little, becomes ductile about 90°, melts at 99°, becoming transparent like a white oil; at 180° begins to be vaporized, and at 554° boils. It is crystallizable into prismatic needles or long octohedra. It exists in many minerals, and is obtained from bones and other animal substances.

In its solid state, phosphorus is not acted upon by pure oxygen gas, but when melted, burns in it at 80° with a dazzling splendour, absorbing about half its weight of oxygen, and forming phosphoric acid. In atmospheric air, it undergoes a slow combustion at 43°, emitting light in the dark, but without the production of sensible heat; absorbing a portion of oxygen, and forming phosphorous acid; at 148° it burns rapidly, but less brilliantly than in oxygen gas, forming phosphoric acid. It is therefore always kept immersed in boiled water; but even there its surface is oxydized, becoming white and opaque.

Oxyd of phosphorus is a solid of a red colour, not volatile, and requiring a heat above 212° for its fusion. Sir H. Davy thinks it may consist of two parts of phosphorus and one of oxygen.

Hydro-phosphorous acid is a white crystalline solid, but water is essential to its composition. It contains four of phosphorous acid and two of water. It is readily soluble in water. The solution has a fetid odour, and disagreeable taste; and gives out a thick white smoke and vivid flame when strongly heated. It is decomposed by ignited charcoal, and by heating in contact with ammonia.

Phosphoric acid is also composed of phosphorus and oxygen. It is crystallizable, fusible, and vitrescent. Its specific gravity is 2.687. It dissolves in water, producing great heat. It readily attracts moisture from the atmosphere, and then its specific gravity becomes 1.417. It is decomposed at a high temperature by hydrogen and carbon, and by several of the metals. It consists of 40 phosphorus and 60 oxygen.

Phosphorus burns in chlorine with a pale flame, throwing off sparks, and forms two compounds according to their proportions.

Protochloride of phosphorus is a fluid as clear as water, to which its specific gravity is 1.45. It emits acid fumes when exposed to the air by decomposing the air. It does not redden dry litmus paper. Its vapour burns in the flame of a candle. It dissolves phosphorus when heated. It is decomposed by water, forming phosphorous and muriatic acids, and by ammonia, depositing a part of its phosphorus. It is converted by chlorine into the perchloride. It consists of one proportion of phosphorus, and two of chlorine.

Perchloride of phosphorus is a snow-white substance, crystallizable, very volatile, but fusible under pressure. It produces flame when exposed to a lighted taper. Its vapour reddens litmus paper. It forms an insoluble compound with ammonia, having characters analogous to an earth. It is decomposed in a red-hot tube by oxygen, and it acts violently on water, forming phosphoric and muriatic acids. It consists of one of phosphorus and four of chlorine.

Phosphureted hydrogen gas varies in specific gravity from 4 to 7,

hydrogen being 1. It has a disagreeable alliaceous smell. It explodes with a most intense white light in oxygen gas. It detonates with a brilliant green light in chlorine. Water absorbs about $\frac{1}{10}$ of its volume; and it is decomposed by electricity, heated metals, &c.

Hydrophosphoric gas, disagreeable smell, specific gravity 12. to hydrogen. Water absorbs $\frac{1}{8}$ of its volume. It explodes with a white flame in chlorine, one volume absorbing four of the latter. It does not explode spontaneously with oxygen, but detonates violently when heated to 303° Fahrenheit, three volumes absorbing more than five.

Sulphureted phosphorus contains various proportions of its elements. It is exceedingly inflammable and more fusible than either of its constituents. 1 of phosphorus and 3 of sulphur congeal at 100° Fahrenheit. 2 of phosphorus and 1.5 of sulphur remain liquid at 40°, and 8 of phosphorus and 1 of sulphur at 68°.

Nitrogen gas dissolves phosphorus, forming a fetid gas, which inflames at a low temperature.

Phosphuret of lime is insoluble in water, but they decompose each other, producing phosphureted hydrogen gas, which arises in bubbles to the surface of the water, where they explode with a clear flame. Phosphuret of baryta is a brown mass; of a metallic appearance; very fusible; luminous in the dark; decomposed by exposure to air; emitting an alliaceous smell when moistened; and decomposed by water, furnishing phosphureted hydrogen gas. The phosphuret of strontia is very similar.

Medical use.—With respect to this, its employment is as yet too limited, to enable satisfactorily to state its efficiency in medical practice. Its properties indicate, however, that its powers must be great, and that too much caution cannot be taken to avoid the dangers in which the patient may be involved, by carelessness and inattention.

The following remarks from Dr. Chapman's Therapeutics, may serve to evince its effects, &c. Vol. 2, p. 173.

"As soon almost as it was known, it came to be used in various diseases, especially in France. But owing to the violence of its action, which could not easily be restrained, and the fatal effects it occasionally produced, it seems to have been universally abandoned as, at least, an unruly and dangerous remedy.

"After a considerable lapse of time, it was once more revived, and its use may be traced in England, in pretty nearly the same diseases, in which it had been previously tried on the continent. It there experienced a similar fate, and probably for the same reasons.

"As a medicine, we hear nothing more of it, till fifteen or twenty years ago, when the medical journals of almost every country of Europe, by the number of communications they contained relative to it, showed that it commanded great attention. It was extensively employed in the French military hospitals in low fevers, and with a view of checking gangrene from wounds and other causes. Nearly at the same time, the physicians of different countries seem to have been busily engaged, in experimenting with it in the diseases al-

ready mentioned, and also, in the whole of the nervous and spasmodic affections, to which may be added, gout and rheumatism, dropsy, amenorrhœa, impotency, uterine hæmorrhages, and finally, in correcting the effects of the mineral poisons, as lead, arsenic, &c.

"As is usual with regard to all new remedies, much was said of the value of phosphorus in the treatment of the copious catalogue of diseases which I have mentioned. But whatever may have been the degree of its utility, it appears fully balanced, by the hazardous nature of the medicine, and the positive mischief which is acknowledged to have resulted from it. Even in its moderate operation, phosphorus is described, as stimulating the whole system, invigorating the circulation, augmenting animal temperature, promoting the secretions, particularly of the skin and kidneys, imparting force to the muscles, bracing the nerves, inflaming venereal desire, and arousing the mind to animation and hilarity."

Its ethereal solution is unquestionably the best mode of exhibiting it. This may be made in the proportion of eight grains to the ounce, of which four or five drops, containing about one sixteenth of a grain, may be given, two, three, or more times a day, in some spirituous tincture.

PHYTOLACCA. *A. Poke. The Root.*

American Nightshade. Garget. The Leaves, Berries, and Roots.

It is also enumerated again in the secondary list of the United States' Pharmacopœia!

This is one of the most common North American plants, well known in New-England by the name of cunicum, shoke, or coakum. In the Southern States it is called pokeweed. It has a thick, fleshy, perennial root as large as parsnips. From this rise many purplish herbaceous stalks, about an inch thick, and six or seven feet long; which break into many branches, irregularly set with large, oval, sharp-pointed leaves, supported on short foot-stalks. These are, at first, of a fresh green colour, but as they grow old they turn reddish. At the joints and divisions of the branches, come forth long bunches of small bluish coloured flowers, consisting of five concave petals each, surrounding ten stamina and ten stiles. These are succeeded by round depressed berries, having ten cells, each of which contains a single smooth seed. The young stems when boiled are as good as asparagus, but when old they are to be used with caution, being a plant of great activity, operating both as an emetic and cathartic. A tincture of the ripe berries in brandy or wine, is a popular remedy for rheumatism and similar affections; and it may be given with safety and advantage in all cases where guaiacum is proper. The extract of the juice of the ripe berries has been employed in some cases of scrofula; and cancerous ulcers have been great-

ly benefited by its application. The juice of the leaves, however, is said to be more effectual.

Dr. Shultz in his ingenious inaugural dissertation on this subject observes, that "scabies and herpes have often been removed by it. In these cases, a solution of the extract in water is generally substituted where the expressed juice cannot be had. In rheumatisms, the whole substance of this plant has at different times been of essential service; although the berries have generally been preferred. In those rheumatic affections which sometimes occur to syphilitic patients, its virtue far exceeds that of opium; and it seems more valuable than guaiacum, especially when combined with mercury.

"For medicinal purposes, the leaves should be gathered about July, when the foot-stalks begin to assume a reddish colour, dried in the shade, and powdered for use. An extract may easily be obtained from the leaves when gathered at this period, by gently evaporating their expressed juice to a proper consistence."

A tincture may be made by dissolving either the extract or the leaves, in their green or dry state, in common brandy, or in the spirit distilled from the berries.

An ointment is also made by powdering the dried leaves, and mixing them well with hog's lard, or simple cerate; or by boiling some hog's lard and bees-wax with fresh leaves, and straining the mass. The proper time for gathering the berries in this climate is in October, when they become soft and ripe, and are of a blackish colour.

The root is to be gathered about November or December, when the stalks of the plant are perfectly dead, and to facilitate drying, it should previously be divided into small pieces. An extract may be made from the root in the same manner as from the leaves or berries.

It is affirmed by a physician of reputation and experience, that the leaves of phytolacca decandra have been found an admirable remedy in hæmorrhois. A strong infusion is given internally, and if it does not speedily relieve, the same infusion is to be injected into the rectum. This method will in general effect a perfect cure.

According to the experience of Drs. Jones and Kollock, of Savannah, this plant may be relied on as an effectual remedy for syphilis in its various stages, even without the aid of mercury; and they employ it with much confidence, both internally and externally, in rheumatisms, and in cutaneous eruptions. One ounce of the dried root infused in a pint of wine, and given to the quantity of two spoonsfull, operates kindly as an emetic. The roots are sometimes applied to the hands and feet of patients in ardent fevers. Many country people use the extract with great confidence in its efficacy in discussing indolent tumours, and in healing various kinds of ulcers. It is found to operate as a mild vegetable caustic, cleansing and healing foul ulcers better than most other remedies of that class. In three cases of apparent *fistula lachrymalis*, it is reputed to have performed cures, by being applied to the tumours twice a day for two or three weeks. This root has also been employed in compounds as an article of dyeing.

PILULÆ.—PILLS.

This form is peculiarly adapted to those drugs which operate in a small dose, and whose nauseous and offensive taste or smell require them to be concealed from the palate.

Pills should have the consistence of a firm paste, a round form, and a weight not exceeding five grains. Essential oils may enter them in small quantity: deliquescent salts are improper. Efflorescent salts, such as carbonat of soda, should be previously exposed, so as to fall to powder: deliquescent extracts should have some powder combined with them. The mass should be beaten until it becomes perfectly uniform and plastic. Powders may be made into pills with extracts, balsams, soap, mucilages, bread-crumb, &c.

Gum-resins, and inspissated juices are sometimes soft enough to be made into pills, without addition: where any moisture is requisite, spirit of wine is more proper than syrups or conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light dry powders require syrup or mucilages: and the more ponderous, as the mercurial and other metallic preparations, thick honey, conserve or extracts.

Light powders require about half their weight of syrup; or of honey, about three fourths their weight; to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices, are to be first softened with the liquid prescribed: the powders are then to be added, and the whole beat thoroughly together, till they be perfectly mixed.

The masses for pills are best kept in bladders, which should be moistened now and then with some of the same kind of liquid that the mass was made up with, or some proper aromatic oil.

When the mass is to be divided into pills, a given weight of it is rolled out into a cylinder of a given length, and of an equal thickness throughout, and is then divided into a given number of equal pieces, by means of a simple machine. These pieces are then rounded between the fingers; and, to prevent them from adhering, they are covered either with starch, or powder of liquorice, or orris root. In Germany the powder of lycopodium is much used. Magnesia is perhaps preferable to any other powder for covering pills.

PILULÆ ALOETICÆ. *A. E.* *Aloetic Pills.*

Take of
  Socotorine aloes, in powder,
  Castile soap, of each, an equal part.
With water or syrup form a mass fit for making pills.

Pilulæ Aloes cum Zingibere. *D.* *Pills of Aloes and Ginger.*

Take of
Hepatic aloes, ... one ounce;
Ginger root, in powder, ... one drachm;
Soap, ... half an ounce;
Essence of peppermint, ... half a drachm.
Powder the aloes with the ginger, then add the soap and the oil, so as to form an intimate mixture.

Pilulæ Aloes Compositæ. *L.* *Compound Pills of Aloes.*

Take of
Socotorine aloes, powdered, . . . one ounce;
Extract of gentian, ... half an ounce;
Oil of caraway seeds, ... two scruples;
Syrup of ginger, ... as much as is sufficient.
Beat them together into an homogeneous mass.

Although soap can scarcely be thought to facilitate the solution of the aloes in the stomach, as was supposed by Boerhaave and others, it is probably the most convenient substance that can be added to give it the proper consistence for making pills. When extract of gentian is triturated with aloes, they re-act upon each other, and become too soft to form pills, so that the addition of any syrup to the mass is perfectly unnecessary, unless at the same time some powder be added to give it consistency.

These pills have been much used as warm and stomachic laxatives: they are very well suited for the costiveness so often attendant on people of sedentary lives. Like other preparations of aloes, they are also used in jaundice, and in certain cases of obstructed menses. They are seldom used for producing full purging; but if this be required, a scruple or half a drachm of the mass may be made into pills of a moderate size for one dose.

PILULÆ ALOES ET COLOCYNTHIDIS. *A.*

Pilulæ Colocynthidis Compositæ. *E. D.*

Pills of Aloes and Colocynth, formerly Pilulæ Cochiæ.

Take of
Socotorine aloes,
Scammony, each, . . . two ounces;
Sulphat of potass, . . . two drachms;
Colocynth, ... an ounce;
Oil of cloves, ... two fluid drachms.
Reduce the aloes and scammony into a powder with the sulphat of potass, then add the colocynth in fine powder, and the oil of cloves, and with mucilage or simple syrup form a mass.

Reduce the aloes and scammony into a powder with the salt; then let the colycynth, beat into a very fine powder, and the oil, be added; lastly, make it into a proper mass with mucilage of gum arabic.

In these pills we have a very useful and active purgative; and where the simple aloetic pill is not sufficient for obviating costiveness, this will often effectually answer the purpose. Little of their activity can depend upon the salt which enters the composition. These pills often produce a copious discharge in cases of obstinate costiveness, when taken to the extent only of five or ten grains; but they may be employed in much larger doses. They are, however, seldom used with the view of producing proper catharsis. Half a drachm of the mass contains about five grains of the colycynth, ten of the aloes, and ten of the scammony.

PILULÆ ALOES ET MYRRHÆ. *A. E. D. L.*

Pills of Aloes and Myrrh, formerly Pilulæ Rufi.

Take of
- Socotorine aloes, ... two ounces;
- Myrrh, ... one ounce;
- Saffron, ... half an ounce.

Beat them into a mass with a proper quantity of syrup.

These pills have long continued in practice, without any other alteration than in the syrup with which the mass is made up, and in the proportion of saffron, which might indeed be altogether omitted, without any disadvantage. The virtues of this medicine may be easily understood from its ingredients. Given to the quantity of half a drachm or two scruples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives.

PILULÆ ALOES CUM MYRRHA ET GUAIACO. *A.*

Pills of Aloes, Myrrh and Guaiacum.

Take of
- Socotorine aloes, in powder, . . . half an ounce;
- Saffron, in powder,
- Myrrh, in powder, each, ... two drachms;
- Resin of guaiacum, in powder, . . half an ounce;
- Oxyd of antimony, ... half an ounce.

With copaiba form a mass.

It is rather strange that the name of these pills should be taken from the least important articles; whilst the most active one, *oxyd of antimony*, is altogether unnoticed!

PILULÆ ANTIMONIALES COMPOSITÆ. *A.*

Compound Antimonial Pills.

Take of
Sub-muriat of mercury, . . . two drachms;
Opium, in powder, ... one drachm;
Tartarized antimony, ... one scruple.
With syrup form a mass to be divided into sixty pills.

Here again the name is derived, if not from the least efficient, from the least in *amount* of the conjoined articles!

PILULÆ ASSAFŒTIDÆ. *A.* *Assafœtida Pills.*

Take of
Assafœtida, . . . three parts;
Castile soap, . . one part.
With water, (or better, tincture of assafœtida,) beat into a mass.

PILULÆ ASSAFŒTIDÆ COMPOSITÆ. *A.*

PILULÆ ALOES ET ASSAFŒTIDÆ. *E.*

Compound Assafœtida Pills. Pills of Aloes and Assafœtida.

Take of
Socotorine aloes, in powder,
Assafœtida,
Soap, equal parts.
Form them into a mass with mucilage of gum arabic.

These pills, in doses of about ten grains twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

PILULÆ ASSAFŒTIDÆ COMPOSITÆ. *E.*

Compound Pills of Assafœtida.

PILULÆ MYRRHÆ COMPOSITÆ. *D.* *Compound Pills of Myrrh.*

PILULÆ GALBANI COMPOSITÆ. *L.* *Compound Pills of Galbanum.*

Take of
Assafœtida,
Galbanum,
Myrrh, each, ... eight parts;
Rectified oil of amber, . . . one part.
Beat them into a mass with simple syrup.

These pills are designed for anti-hysterics and emmenagogues,

and are very well calculated for answering those intentions; half a scruple, a scruple, or more, may be taken every night or oftener.

The rectified oil of amber is a very injudicious addition, as it prevents the pills from acquiring a proper degree of hardness. The tincture of assafœtida is preferable, and this is certainly the case with all those pills, formed of substances of which a tincture is likewise prepared.

PILULÆ AURI MURIATIS. *A.* *Pills of Muriat of Gold.*

Take of
Muriat of gold, ... ten grains;
Liquorice, in powder, . . . three drachms.
With simple syrup form a mass and divide into a hundred and fifty pills.

We suspect this will be a difficult preparation, equally to apportion a *fifteenth part* of a grain of the muriat of gold to each pill.

Pilulæ Gambogiæ Compositæ. *E. L.*

Compound Pills of Gamboge.

Take of
Gamboge, in powder,
Socotorine aloes, in powder,
Compound powder of cinnamon, of each, . . . one drachm;
Soap, ... two drachms.
Mix the powders, then add the soap, and beat the whole into an homogeneous mass.

This is a very useful purgative pill, being considerably more active than aloes alone.

PILULÆ GAMBOGIÆ ET SCAMMONIÆ. *A.*

Pills of Gamboge and Scammony.

Take of
Gamboge, in powder, . . . one ounce;
Scammony, in powder, . . half an ounce;
Nitrat of potass, ... one drachm;
Castile soap, ... two drachms;
With water form a mass and divide into four hundred pills.

Why is nitrat of potash added? Is it of any service, or rather, will not some decomposition of it ensue by means of the soda of the Castile soap?

PILULÆ COLOCYNTHIDIS EXTRACTI COMPOSITI. *A.*

Pills of Compound Extract of Colocynth.

Take of
Compound extract of colocynth, . . . a drachm and a half;
Oxyd of antimony, ... half a drachm.
Form a mass, and divide into thirty pills.

This is pretty nearly the composition of Fothergill's pills.

PILULÆ FERRI SULPHATIS. *A.* *Pills of Sulphat of Iron.*

Take of
Sulphat of iron, one drachm.
With the extract of gentian form a mass, and divide into thirty pills.

Unless deprived of its water of crystallization, it will be difficult to make up these pills.

PILULÆ FERRI SULPHATIS COMPOSITÆ. *A. E.*

PILULÆ FERRI COMPOSITÆ. *L.*

Compound Pills of Sulphat of Iron. Compound Pills of Iron.

Take of
Rhubarb, in powder, . . . one drachm and a half;
Sulphat of iron, ... two scruples;
Castile soap, ... half a drachm.
With water form a mass and divide into forty pills.

We think this formula inferior to either of those of the Edinburgh or London Colleges; the sulphat is probably decomposed in the process by the soap.

PILULÆ HYDRARGYRI. *A. E. L. D.* *Mercurial or Blue Pill.*

Take of
Purified mercury,
Conserve of roses, each, ... one ounce;
Liquorice, in powder, ... half an ounce.
Rub the mercury with the confection in a glass mortar till the globules disappear; then add the liquorice and form a mass to be immediately divided into four hundred and eighty pills.

The common mercurial pill is one of the best preparations of mercury, and may, in general, supersede most other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxyd. To effect its mechanical division, it must be triturated with some viscid substance. Soap, resin of guaiac, honey, extract of liquorice, manna, and conserve of roses, have all been at different times recommended. The soap and

guaiac have been rejected on account of their being decomposed by the juices of the stomach; and the honey, because it was apt to gripe some people. With regard to the others, the grounds of selection are not well understood; perhaps the acid contained in the conserve of roses may contribute to the extinction of the mercury. We learn when the mercury is completely extinguished, most easily, by rubbing a very little of the mass with the point of the finger on a piece of paper, if no globules appear. As soon as this is the case, it is necessary to mix with the mass a proportion of some dry powder, to give it a proper degree of consistency. For this purpose, powder of liquorice root has been commonly used; but it is extremely apt to become mouldy, and cause the pills to spoil. The Edinburgh College have, therefore, with great propriety, substituted for it starch, which is a very unalterable substance, and easily procured at all times in a state of purity. It is necessary to form the mass into pills immediately, as it soon becomes hard. One grain of mercury is contained in four grains of the Edinburgh mass, three of the London and Dublin, and two and an half of the American. The dose of these pills must be regulated by circumstances; from two to six five-grain pills may be given daily.

It is believed, that experiments, fairly made, would sanction the manna in preference to any other substance for the speedy and effectual extinction of the quicksilver: and whatever may be thought of the conserve of roses, it appears probable its use is only dependent on the sugar in its composition.

PILULÆ HYDRARGYRI OXYMURIATIS. *A.*

Pills of Oxymuriat of Mercury. Corrosive Sublimate.

Take of

Oxymuriat of mercury, . . . ten grains;
Arrow root, ... one scruple.

With muriat of ammonia dissolved in water form a mass.

We have already objected to the name of oxymuriat of mercury; and in the present formula, it is even still less proper. The consequence of adding muriat of ammonia to corrosive sublimate is, that a different salt is produced, the old sal alembroth; and consequently to the full extent, the corrosive sublimate is not present in the pills made up. The formula is defective in not stating how many pills are to be formed from the mass prepared.

PILULÆ HYDRARGYRI SUBMURIATIS. *A.*

Pills of Submuriat of Mercury. Calomel Pills.

Take of

Submuriat of mercury, . . . half a drachm;
Castile soap, ... one scruple.

With water form a mass and divide into thirty pills.

Here is probably a decomposition of the calomel by the soap.

Pilulæ Hydrargyri Submuriatis Compositæ. *L.*

Compound Pills of Submuriat of Mercury.

Take of
Submuriat of quicksilver,
Precipitated sulphuret of antimony, of each, . . . one drachm;
Guaiac, in powder, ... two drachms.
Triturate the submuriat with the precipitated sulphuret of antimony, and then with the guaiac; add as much mucilage of gum arabic as will give the mass a proper consistence.

These pills were recommended to the attention of the public, about forty years ago, by Dr. Plummer, whose name they long bore. He represented them, in a paper which he published in the Edinburgh Medical Essays, as a very useful alterative; and on his authority they were at one time much employed; but they are now less extensively used than formerly.

PILULÆ JALAPÆ COMPOSITÆ. *A.*

Compound Pills of Jalap.

Take of
Jalap, in powder,
Rhubarb, in powder,
Castile soap, each, ... one ounce;
Submuriat of mercury, . . . six drachms and two scruples;
Tartarized antimony, ... twenty-eight grains.
With water form a mass, and divide into four hundred pills.

The tartar emetic enters into this composition in about one sixty-fifth part. Whether it is of any great effect, we cannot say; it is presumable, the other ingredients would act sufficiently without it, and indeed we should doubt its being, without great care, accurately divided amongst so large a mass of materials.

PILULÆ MYRRHÆ ET FERRI. *A.* *Pills of Myrrh and Iron.*

Take of
Purified iron filings, . . . one ounce;
Myrrh, in powder,
Castile soap, each, ... two drachms.
With syrup form a mass and divide into pills, each weighing six grains.

We believe this preparation would be improved by using the carbonat of iron in place of the filings.

PILULÆ OPII. *A.* *Pills of Opium.*

Pilulæ Opiatæ. *E.* Pilulæ Thebaicæ. *Opiate, or Thebaic Pills.*

Take of
 Opium, in powder, . . . one drachm;
 Castile soap, . , ... twelve grains.
With water form a mass, and divide into sixty pills.

PILULÆ PICIS. *A.* *Tar Pills.*

Take of
 Tar, ... one drachm;
 Elecampane, in powder, . . . a sufficient quantity to form a mass, to be divided into sixty pills.

Starch is better than elecampane.

Pilulæ Ammoniureti Cupri. *E.* *Pills of Ammoniuret of Copper.*

Take of
 Ammoniuret of copper, . . sixteen grains;
 Bread crumb, ... four scruples;
 Water of carbonat of ammonia, as much as may be sufficient.
Beat them into a mass, to be divided into thirty-two equal pills.

Each of these pills weighs about three grains, and contains somewhat more than half a grain of the ammoniuret of copper. They seem to be the best form of exhibiting this medicine.

PILULÆ RHÆI COMPOSITÆ. *A.* *E.*

Compound Pills of Rhubarb.

Take of
 Rhubarb, ... one ounce;
 Socotorine aloes, ... six drachms;
 Myrrh, ... half an ounce;
 Essential oil of peppermint, . . half a drachm.
Make them into a mass, with a sufficient quantity of syrup of orange peel.

This pill is intended for moderately warming and strengthening the stomach, and gently opening the belly. A scruple of the mass may be taken twice a day.

PILULÆ SCILLÆ. *A.* *Pills of Squill.*

Take of
 Dried squills, in powder, . . . one drachm;
 Castile soap, ... twenty-four grains.
With water form a mass, and divide into forty pills.

We prefer the following:

PILULÆ SCILLITICÆ. *E.* *Squill Pills.*

PILULÆ SCILLÆ COMPOSITÆ. *L.* *Compound Pills of Squill.*

PILULÆ SCILLÆ cum ZINGIBERE. *D.* *Squill Pills with Ginger.*

Take of
Powder of squills, ... one drachm;
Ginger, in powder, ... two drachms;
Essential oil of aniseed, . . . ten drops.
Triturate together, and form into a mass with jelly of soap.

This is an elegant and commodious form for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtue of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescription.

PILULÆ SODÆ SUBCARBONATIS. *A. E.*

Pills of Subcarbonat of Soda.

Take of
Subcarbonat of soda, dried, . . . two drachms;
Castile soap, ... half a drachm.
Form a mass, and divide into forty pills.

The directions are not sufficiently explicit.

This is one of the most convenient forms of giving soda. It was introduced into use by Dr. Beddoes; but the pills were seldom well prepared. The salt must be perfectly effloresced, and must be beaten with the soap, with simple syrup, as stiff as possible. We think conserve of roses is preferable for the purpose.

PILULÆ ARSENICI. *A.* *Pills of Arsenic.*

Take of
Arsenious acid, ... two grains;
Opium, in powder, . . . eight grains;
Castile soap, ... twenty-two grains.
Form a mass, and divide into thirty-two pills.

We think this, as well as the pills of corrosive sublimate and of muriat of gold, would be more easily and correctly prepared, by adding a definite amount of the article in solution, to crumb of bread, and forming the pills from the impregnated mass.

PIMPINELLA ANISUM. *E. L. D.* ANISUM. *A.*

Anise. The Seeds and Essential Oil.

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the east. It is cultivated in some parts of France, Germany and Spain, and may be raised also in England: the seeds brought from Spain, which are smaller than the others, are preferred.

Aniseeds have an aromatic smell, and a pleasant warm taste, accompanied with a degree of sweetness. Water extracts very little of their flavour; rectified spirit the whole.

PINUS.

Monœcia Adelphia.—Nat. ord. *Coniferæ.*

PINI, RESINA ET OLEUM.

The Resin and Oil of the different species of Pines, and the impure Turpentine, procured by burning.

PINUS LARIX. *E. L. D.* *Common White Larch.*

Venice Turpentine. Oil of Turpentine.

A small and beautiful tree, native of Switzerland and Germany, but much cultivated in England.

PINUS PICEA. *Silver Fir Tree.*

A moderate sized tree, native of Switzerland and Germany, and also cultivated in England, and which is said by Dr. Thornton, on the authority of Murray, who follows Drs. Hamel and Haller, to yield the terebinthina vulgaris; although Woodville and several other writers refer it to the pinus sylvestris.

PINUS ABIES. *A. E. L. D.* *Norway Spruce Fir Tree.*

Common Frankincense. Burgundy Pitch.

A small tree, a native of Scotland, and common in Norway, yielding by incision of its bark, a clear tenacious fluid, which concretes into a resinous substance known by the name of resina abietis. This being boiled in water, and strained through linen, is the Pix Burgundica, or Burgundy pitch of the Pharmacopœias. But if the boiling of the native resin is continued till the water is wholly evaporated, and wine vinegar is at this time added, a substance named colophony is formed. Tingry says, the real Burgundy pitch is collected from the *pinus picea.*

Pinus Sylvestris. *E. L. D. Scotch Fir.*

Common Turpentine. Oil of Turpentine. Rosin. Tar. Black Pitch.

Inhabits more generally the northern parts of Europe. It is common likewise in Scotland; Miller, however, describes the Scotch tree as a distinct species, under the name of pinus rubra. The pinus sylvestris not only furnishes most abundantly the pix liquida, or tar, but also from it may be obtained the common turpentine, and the white and yellow resins.

PINUS PALUSTRIS. *A.*

Tar. The impure Turpentine, procured by burning.

Pinus Balsamea. *E. D. L. Hemlock Fir.*

Balsam of Canada. Canadian Turpentine.

The products of the different species of pine may be arranged,

1. Into those which exude spontaneously.
2. Into those produced by wounding the tree.
3. Into those procured by decoction. And
4. Into those which are procured by the action of fire.

By Exudation.

The pinus larix exudes a species of manna, called Briancon Manna, but it is not used; as, besides the saccharine matter, it evidently contains turpentine.

From the pinus abies, and also from the pinus sylvestris, in warm seasons and climates, a resinous juice exudes spontaneously, which hardens into tears, by exposure to the air. It is the common frankincense, or *Thus* of the former editions of the London Pharmacopœia, but no longer officinal. It is a solid brittle resin, brought to us in tears, or masses, of a brownish or yellowish colour on the outside; internally whitish, or variegated with whitish specks, of a bitterish, acrid, not agreeable taste, with little smell.

Real burgundy pitch is collected, according to Tingry, from the pinus picea, or spruce fir tree. The resinous juice which exudes from this species is less fluid and less transparent than the proper turpentines. It is collected by the peasants, strained through cloths, and put into barrels. If its consistence be too thick, it is mixed over the fire with a little turpentine and oil of turpentine.

By Incision.

To obtain the products of the second kind, a series of wounds is made through the bark into the wood, beginning at the bottom, and rising gradually upwards, until a stripe of the bark, about nine feet high, be removed, which is commonly effected in about four years. The same operation is then repeated on the opposite side. The ope-

ration is then recommenced close to the edge of the former wound, which by this time is nearly closed. A tree worked in this manner will survive, and furnish turpentine for near a century. The juice, or turpentine, which flows from these wounds, during summer, is collected in a small cavity formed in the earth, at the bottom of the incisions, from which it is occasionally removed into proper reservoirs, previous to its purification.

As the trees exude very little juice during cold weather, no new incisions are made in winter; but the old ones get covered with a soft resinous crust (called *barras*, when it is impure, and mixed with bits of bark, dust, and sand; *gallipot*, when collected with more care; or *white incense*, when it is allowed to remain so long exposed that it becomes resinified), which is scraped off, and also collected for subsequent purification. All these products are purified by liquefaction and filtration. They consist almost entirely of essential oil and a resin, and differ only in the proportions, the turpentine containing the largest proportion of oil, and the gallipot of resin. Although gallipot contains essential oil, the quantity is so small, that it is never subjected to distillation, but is purified by melting it with a very gentle fire, and filtrating it. By this process it still contains essential oil, and is often sold by the name of Burgundy pitch. If boiling water be added to it after it is strained, but while it is still fluid, and they be agitated together till the mass cools, we have a yellow resin, which, from still containing some essential oil, is preferred to that prepared, by a similar process, from the residuum of the distillation of turpentine A simple mixture of gallipot and barras, made without heat, is often sold under the name of Burgundy pitch; but the mass resulting from this combination soon becomes friable. It has neither the unctuosity, viscidity, tenacity, nor smell, which distinguish the real kind.

Turpentines.

Turpentines, or fluid resinous juices obtained by incision, have different appellations, chiefly according to the country from which they are procured.

Balsam of Canada, from the *Pinus balsamea* and *Pinus Canadensis.*
Resina liquida Pini Balsameæ. E.
Terebinthina Canadensis. L.
Balsamum Canadense. D.
Cyprian turpentine, from the *Pistacia terebinthus.*
Terebinthina chia. L.
Strasburgh turpentine, from the *Pinus picea.*
Venice turpentine, from the *Pinus larix.*
Resina liquida pini laricis. E.
Terebinthina veneta. D.
Common turpentine, from the *Pinus sylvestris.*
Terebinthina vulgaris. L. D.
Hungarian balsam, from the *Pinus sylvestris, var. Mughos.*
Carpatian balsam, from the *pinus cembra.*

None of these are properly balsams; which term is now confined by chemists to those resinous substances which contain benzoic acid. The Edinburgh College have denominated them liquid resins, which is rather a description than a name. Perhaps the London College have done better in retaining turpentine as a proper generic name for these resinous juices.

All these species of turpentine possess the same general properties. They are more or less fluid, with different degrees of transparency: of a whitish or yellowish colour; a penetrating smell, and a warm, pungent, bitterish taste. They are entirely soluble in alcohol, combine with fixed oil, and impart their flavour to water, but are not soluble in it. They are decomposed by a moderate heat, being separated into an essential oil and a resin, and are exceedingly inflammable, burning with a large white flame, and much smoke.

Each species has some peculiarities. The Canadian is reckoned the best, and next to it the Chian. They are more transparent, and have a more agreeable flavour than the other kinds. The common turpentine, as being the most offensive, is rarely given internally; its principal use is in plasters and ointments among farriers, and for the distillation of the essential oil.

Medical use.—Taken internally, they are active stimulants, open the bowels, and increase the secretion of urine, to which they give the smell of violets, even though applied only externally. In all cases accompanied with inflammation, they ought to be abstained from, as this symptom is increased, and not unfrequently occasioned by them. They are principally recommended in gleets, fluor albus, and the like. Their dose is from a scruple to a drachm and a half. They are most commodiously taken in the form of a bolus, or blended with watery liquors, by the mediation of the yelk of an egg, or mucilage. They also may be given in the form of electuary, mixed with twice their weight of honey, and in the dose of a drachm of the compound twice or thrice a day; or of clyster, half an ounce being well triturated with the yelk of an egg, and mixed with half a pound of gruel, or decoction of chamomile.

By distillation turpentines are analysed into two products, a solid resin and a volatile oil.

Oil of turpentine is lighter than water, transparent, limpid, and volatile. It has a hot pungent taste, and a penetrating smell; is highly inflammable, and possesses all the other properties of essential oils.

It is remarkably difficult of solution in alcohol, although turpentine itself dissolves easily. One part of the volatile oil is indeed apparently taken up by seven of alcohol; but on standing, the greatest part of the oil falls to the bottom, a much larger quantity of alcohol being necessary to retain it in solution.

Medical use.—As a medicine, it is highly stimulating and penetrating. Internally it acts as a diuretic or sudorific in very small doses. It has also been given in large doses, mixed with honey, principally in those modifications of chronic rheumatism which are

styled *sciatica* and *lumbago*. But it has not been often successful, and sometimes has had the effect of inducing bloody urine.

Lately, however, its use in very large doses has been renewed, and with almost invariable success, in one of the most obstinate complaints to which the human body is subject, the tape worm. For this valuable discovery we are indebted to Dr. Fenwick, of Durham; although its use, both in worms and epilepsy, seems to have been previously known to Dr. Latham; and cases of its efficacy have been published by Drs. Bateman and Laird. It has been given to the extent of four ounces in one dose, without any perceptible bad effects, and scarcely more inconvenience than would follow from an equal quantity of gin. In large doses it is not apt to produce strangury, but only an approach to intoxication, and it generally acts as a speedy purgative, and discharges the worm in all cases, *dead*.

Dr. Percival, of Dublin, has also lately given it in epilepsy, and with some success. Two drachms, four drachms, or one ounce, were mixed by means of syrup, with one pound of mint water; and of this emulsion, one or two table spoonfuls were given every four hours. In this form, and given to the extent of several drachms in the course of the day, it produced no distressing symptoms of the urinary organs, stomach, or bowels. It generally procured immediate and decided relief, but it was not always lasting. Dr. Latham suggests, that a large dose should at first be given, and then small doses, so as to keep up the affection of head peculiar to its use.

Externally it often produces excellent effects as a discutient in indolent tumours; as a stimulus in paralysis of the extremities, and in bruises; as an antispasmodic; and as a styptic, when applied on compresses to the bleeding mouths of the vessels, as hot as the patient can bear it, and it is particularly useful as a domestic application in cases of burns.*

Resins.

The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is fiddlers' rosin, or colophony; but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin by long and constant agitation, it is then called yellow rosin.

The under part of the cake of the residuum of the distillation resembles fiddlers' rosin, the action of the fire having entirely expelled the water and volatile oil, and rendered it slightly empyreumatic and transparent, while the upper part, from retaining some water, is opaque and yellow.

* Since the spruce pine and other varieties afford with molasses, a species of beer, highly useful in scurvy; may it not be worth trial, whether oil of turpentine mixed with sugar so as to unite with water, might not be capable, by fermentation, of yielding a liquor that might be useful on ship-board, where the fresh leaves, &c. or the extract of spruce could not be obtained?

By Decoction.

A fluid extract, prepared by decoction from the twigs of the pinus sylvestris, is the well known essence of spruce, which, fermented with molasses, and water, forms the wholesome beverage of Spruce Beer.

By Fire.

The last kind of products from the different species of fir, is obtained by the action of fire. With this view, a conical cavity is dug out in the earth, communicating at the bottom with a reservoir. Billets or thin laths of wood are then placed, so as not only to fill the cavity, but to form a conical pile over it, which is covered with turf, and kindled at the top. The admission of air is so regulated that it burns from above downwards, with a slow and smothered combustion. The wood itself is reduced to charcoal, and the smoke and vapours formed, are obliged to descend into the excavation in the ground, where they are condensed, and pass along with the matters liquified into the receiver. This mixture is denominated Tar, *Pix liquida. E. L. D.* By long boiling, tar is deprived of its volatile ingredients, and converted into Pitch, ***Resina nigra. L.***

Tar is a mixture of resin, empyreumatic oil, charcoal, and acetic acid. Its colour is derived from the charcoal; and the other properties in which it differs from a common resin depend on the presence of acetic acid and empyreumatic oil. The acid itself, is not only soluble in water, but also renders the empyreumatic oil more soluble.

Medical use.—Tar-water is a heating diuretic and sudorific remedy; but by no means so powerful, or so generally admissible, as it was represented by Bishop Berkeley. Tar is applied externally, in tinea capitis and some other cutaneous diseases.

Dr. Bateman has seen good effects in ichthyosis from pitch given internally. It occasioned the rough cuticle to crack and fall off, without the aid of external means, and left a sound skin underneath. This medicine, made into pills with flour, or any farinaceous powder, may be taken to a great extent, three drachms or half an ounce daily, not only without injury, but with advantage to the general health; and affords one of the most effectual means of controlling the languid circulation, and the inert and arid condition of the skin.

Fumigations of tar have been recommended in phthisis by Dr. Crichton; they appear to have relieved in some cases, but have never effected a cure. It is, indeed, a renewal of an old plan of treatment.

AQUA PICIS LIQUIDÆ. *D.* *Tar-water.*

Take of
Tar, ... two pints;
Water, ... one gallon.

Mix, by stirring them with a wooden rod, for a quarter of an hour, and, after the tar has subsided, strain the liquor, and keep it in well-corked phials.

Tar-water should have the colour of white wine, and a sharp empyreumatic taste. It is, in fact, a solution of empyreumatic oil, effected by means of acetic acid. It was, at one time, much extolled as a panacea, but has of late been little employed. It acts as a stimulant, raising the pulse, and increasing the discharge by the skin and kidneys. It may be drunk to the extent of a pint or two in the course of a day.

PIPER. *A.*

PIPER NIGRUM. *E. L. D. Black Pepper. The Berries.*

The black pepper is the fruit of a shrubby creeping plant, which grows wild in the East-Indies, and is cultivated in Java and Malabar, by which means the fruit is much improved. The berries are gathered before they are ripe, and are dried in the sun. They become black and corrugated on the surface; their taste is hot and fiery, and their smell slightly aromatic.

Neumann got from 7680 parts 4800 watery, and afterwards 180 alcoholic extract; and inversely, 1080 alcoholic, and 3640 watery. The principle on which the pungency depends, was soluble both in water and in alcohol, and was not volatile, for 7680 grains furnished about 150 of a very bland volatile oil. From this analysis Dr. Thomson's differs remarkably. By macerating pepper in alcohol, and distilling the tincture, he got a green volatile oil, having the whole flavour and pungency of the pepper. Besides this essential principle, he found it to contain an extractive and starch.

It is singular, that the Sumatrans, who eat such vast quantities of Cayenne pepper, never mix black pepper with their food. They esteem the latter heating, and ascribe a contrary effect to the former; and Mr. Marsden, from experience, agrees with them.

White pepper is the fruit of the same plant, gathered after it is fully ripe, and freed of its external coat, by maceration in water. It is smooth on the surface, and less pungent than the black pepper.

Dr. Frank, physician to her majesty Maria Louisa, recommends the black pepper in different species of intermittent fever. This had previously been used in the East, with success, after every known means had been ineffectually tried.

The dose is five to ten grains twice a day, and Dr. Ghigini reports ten patients cured with it. Dr. Frank mentions seventy patients who

came under his notice between April and June, of whom fifty-two had tertian, ten quotidian, and eight the quartan fever; fifty-four were completely cured within a week or so, without any subsequent relapse.

He dips the seed of black pepper in a mucilage of gum arabic, and subsequently in powdered colombo, to disguise it, and gives from five to eight pills twice a day. None of his patients required more than from seventy to eighty pills for a complete cure.

Piper Longum. *E. L. D. Long Pepper.*

The plant which bears the long pepper is also a sarmentaceous climber. The berries are small round grains, disposed spirally in a long cylindrical head. They are gathered before they are ripe, and dried; and are the hottest of all the peppers.

The warmth and pungency of these spices reside entirely in a resin; their aromatic odour in an essential oil. In medicine they are sometimes employed as acrid stimulants; but their chief use is in cookery as condiments.

Another species of pepper, the *cubeb*, has of late been asserted to possess a very striking power of checking and curing gonorrhœa, taken in powder, to the extent of three drachms, five or six times a day, and continued for a day or two, after the discharge ceases. In a few cases it produced swelled testicles, and in one, urticaria. Its only sensible effects are purging, sometimes increase of urine, and imparting to it its peculiar smell. It is also of use in leucorrhœa.

PISTACIA TEREBINTHUS. *L.*

The Liquid Resin, called Chian Turpentine.

The shrub which yields this turpentine grows in India, the north of Africa, and south of Europe, but the turpentine is principally collected in the islands of Chios and Cyprus, by wounding the tree. It does not differ in any thing material, except its price, from the other turpentines.—See Pinus.

Pistacia Lentiscus. *E. L. The Resin called Mastiche.*

This species is a native of the same countries with the former. It is obtained principally in the island of Chios, by making transverse incisions in the tree, and allowing the juice to harden. It is brought in small yellowish, semi-transparent, brittle grains; of a smooth and shining fracture, softening when chewed, fusible, burning with a pleasant smell, insoluble in water, and partially soluble in alcohol

and fixed oils. Neumann found that during digestion with alcohol, a portion separates insoluble in alcohol, though in appearance resinous, amounting to about one tenth of the mastich, and analogous to caoutchouc. La Grange and Vogel say it contains free acetic acid.

Its flavour is communicated to water. It is therefore a resin, combined with a little essential oil. It is principally used by the Turkish women as a masticatory, to preserve the teeth, and give a pleasant smell to the breath.

PLANTAGO. *Plantain, the Leaves.*

Great plantain is perennial, common in fields and by the road sides, flowering from June to August. The country people apply the bruised leaves of this vegetable to slight wounds, and inflamed sores and swellings, with a favorable effect. It has been recorded in a Virginia Gazette, 1802, that a gentleman was bitten above the knee by a venomous spider. In a few minutes he observed a pain shooting upwards from the spot, which presently reached his heart. A quantity of plantain leaf was immediately procured, and the juice being bruised out was swallowed largely, by which the progress of the poison was arrested, and finally a cure was effected. Some oil was also swallowed, but the plantain leaf had the entire credit of his recovery, and but for this remedy, he said he could not have survived an hour longer.

PLATINUM.—*PLATINA.*

This metal is found in South America, Spain, and St. Domingo, and as far as is known only in those countries. It has been asserted to have been discovered in Siberia, but this has not been confirmed. In the former, at Choco, Santa Fee, and in a district of the Brazils, in form of small roundish flattened grains, &c. In Spain, in a vein principally consisting of silver. It is obtained from its ore, by solution in nitro-muriatic acid, and precipitating by the muriat of ammonia The yellow powder which falls down, is reduced to the metallic state by various processes detailed in chemical writings.

The metal is of a white colour, between silver and lead; it is not so hard as malleable iron; and by hammering is capable of being brought to a specific gravity of 23. It is consequently the heaviest of all known bodies. It is ductile and malleable; capable of being drawn into wires of about $\frac{1}{2000}$ of an inch diameter, and of being hammered into thin plates. A wire of 0.078 of an inch diameter sup-

ports a weight of 274.31 lbs. avoirdupois. It is infusible by the heat of a forge.

Dr. Bollmann, formerly of this city, having paid much attention to this singular metal, and rendered it malleable, it occurred to him to ascertain whether perhaps it might not be possessed of medicinal virtues? He made for that purpose a very convenient preparation—the nitro-muriatic solution of the *purified metal*, combined with soda; convinced himself that it might be given with safety, by taking it in small quantities himself, without experiencing from it any disagreeable effects; and then supplied with this preparation several of the most eminent practitioners of Philadelphia. Professor Barton used it in several decided cases of syphilis, in all of which the medicine effected a prompt, and, to all appearance, a perfect cure. Mercury, however, had been used previously in all of those cases, except one; but in this, though no medicine whatever had been taken before, and venereal ulcers in the throat attested, unequivocally, the presence of the disease, the beneficial operation of the platina was as prompt, and satisfactory, as in the former cases. There seems, therefore, to be sufficient ground for further trials, the result of which will, no doubt, be laid before the public, as soon as a sufficient number of facts have been collected to warrant positive conclusions with regard to the medical efficacy of this substance.*

The only effect apparently produced, was a diminution of the appetite. Further experiments are necessary to establish its antisyphilitic virtues. As it is, Professor Barton was disposed to think very favourably of it. The cases in which it has been administered continued well during an interval of several months.

PLUMBUM. *A. E. L.—LEAD.*

Lead is of a grey, blue, livid colour, streak grey, disagreeable taste, and odour; specific gravity 11.352; soft; very laminable; hardens little under the hammer; very flexible; slightly tenacious; fusible at 612° Fahrenheit; volatile at a red heat; tarnished in the air; slightly oxydized by air and water; by heat and air it forms a grey, then a yellow, and lastly, a red oxyd, which is vitrifiable. Its phosphuret and sulphuret are brittle; it forms alloys with arsenic, bismuth, antimony, mercury, zinc, and tin; it is oxydized by, and combines with the sulphuric, nitric, muriatic, phosphoric, and other acids. Its oxyds impart to glass a uniform density, and strong refracting power.

Lead is found,

I. Oxydized:

1. Lead ochre of different colours.

* Since the last edition of this work, the use of Platina does not appear to have become common; and nothing further has come to my knowledge, beyond what is stated above.

II. Oxydized, and combined with acids.
2. Carbonated lead. White lead spar.
3. Murio-carbonated.
4. Phosphated lead. Green lead ore.
5. Arseniated lead.
6. Arsenio-phosphated lead.
7. Molybdated lead.
8. Sulphated lead.

III. Sulphureted:
9. Sulphureted lead. Galena.
10. Sulphureted oxyd of lead.

Lead is obtained by various processes from these ores. In its metallic form it is scarcely an officinal article, as its different oxyds are purchased from the manufacturers, and never prepared by the apothecary.

States of oxydatiou of Lead.

	Thomson.		Davy.	
	Lead.	Oxygen.	Lead.	Oxygen.
1. Yellow,	91.5	8.5		
2. Yellow, Massicot,	90.5	9.5	398	30
3. Red, Red lead,	88.	12.	398	45
4. Brown,	80.	20.	398	60

Medical use.—Its effects on the body are emaciation, violent colics, paralysis, tremors, and contractions of the limbs; and as they generally come on gradually, the cause is sometimes overlooked till it be too late. Poisoning from lead is never intentional, but only accidental, either from liquors becoming impregnated with lead, by being improperly kept in vessels lined or glazed with lead, or to which lead has been criminally added to correct its acidity; or among manufacturers who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing any of it.

The presence of the lead in any suspected liquor is detected by the hydro-sulphuret of potass, which forms with it a brown precipitate, not soluble in diluted muriatic acid; and still more certainly by evaporating a portion of it to dryness, and exposing the extract to a heat sufficient to reduce the lead.

PLUMBI OXYDUM SEMIVITREUM. *A. E. L.*

Lithargyrum. *D.*

Semivitrified Oxyd of Lead. Litharge.

If oxydized lead be urged with a hasty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greatest part of the litharge met with in the shops, is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and other circumstances,

it proves of a pale or deep colour; the first has been commonly called Litharge of Silver, the other Litharge of Gold.

Litharge is a sub-carbonat of lead; it consists of ninety-six yellow oxyd, and four carbonic acid; it also frequently contains a little oxyd of antimony.

The oxyds of lead dissolve by heat, in expressed oils; these mixtures are the basis of several officinal plasters and ointments.

Lead and its oxyds when undissolved, have no considerable effects as medicines. Dissolved in oils, they are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids, they are remarkably so: and taken internally, prove powerful though dangerous styptics.

PLUMBI SUBCARBONAS. *A. L.*

CARBONAS PLUMBI. *E.* SUB-ACETAS PLUMBI. *D.* CERUSSA.

White Oxyd of Lead. Ceruse. White Lead. Sub-Acetat of Lead. Carbonat of Lead. Sub-Carbonat of Lead.

This substance, which is now said to be a carbonat of lead, is manufactured in several countries. It is prepared by exposing lead to the vapour of vinegar. To accelerate the oxydizement, the lead is cast in thin plates, which are rolled up spirally. A number of these are placed perpendicularly on a support, over a flat vessel containing vinegar, which is converted into vapour by a gentle heat, such as that of dung. The plates become slowly covered with a white crust, which is in due time removed; and the remains of the plates again exposed to the vapour of vinegar, until they be entirely corroded.

Van Mons says, that if lead ashes be dissolved in nitric acid, and precipitated by chalk in impalpable powder, the precipitate, when washed and dried, will be ceruse in its purest state.

White oxyd of lead has a scaly or foliated texture, is brittle, friable, heavy, of a snowy whiteness, and a sweet taste. It is often adulterated with earthy substances, which may be discovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarser particles cannot be separated by means of a sieve, because its instertices soon get filled up. It can only be obtained in the state of a fine powder, by rubbing a loaf of ceruse on a sieve placed over a sheet of paper. It consists of 84 yellow oxyd of lead, and 14 carbonic acid.

In pharmacy, the white oxyd of lead is used in the composition of ointments and plasters.

OXYDUM PLUMBI RUBRUM. *E.* MINIUM. *Red Oxyd of Lead.*

The preparation of red lead is so troublesome and tedious, as scarce ever to be attempted by the apothecary or chemist; nor indeed, is this commodity expected to be made by them, the prepara-

tion of it being a distinct branch of business. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead is destroyed; after which, the oxyd is only now and then turned.

The red oxyd of lead is obtained in the form of a very heavy powder, consisting of very minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated. It is sometimes adulterated with red oxyd of iron, red bole, or powdered brick. These frauds are detected by the inferiority of colour, by mixing it with oil, and subjecting it to the test of reduction; and by its forming a black precipitate with tincture of galls when dissolved in nitrous acid.

PLUMBI ACETAS. *A. E. D.*

SUPER-ACETAS PLUMBI. *L.* SACCHARUM SATURNI.

Acetat of Lead. Super-Acetat of Lead. Sugar of Lead.

Take of
Sub-carbonat of lead, . . . any quantity;
Purified vinegar, ... ten times its weight.

Digest in a glass vessel until the vinegar becomes sweet. Having poured this off, add more vinegar, until it ceases to become sweet. Filter the liquor and crystallize by alternate slow evaporation and refrigeration. The crystals are to be dried in the shade.

The acetat of lead is seldom prepared by the apothecary, as he can procure it at an infinitely cheaper rate from those who manufacture it in large quantities. The preparation of it, as directed by the colleges, is a case of simple solution. The process frequently fails, from the oxyd of lead employed, being adultered with carbonat of lime, or some other earthy substance. The acetic acid employed, should be as strong as can be procured; for with a weak acid, the product of pure salt is small, and the quantity of mother-water is increased. The addition of a small quantity of alcohol to the solution after it has been duly evaporated, is said to improve the beauty of the crystals. The mother water may also be made to furnish pure crystals, by adding to it a fresh portion of acetic acid; for without that precaution it furnishes only a very heavy, yellow, pulverulent mass, in which there seems to be an excess of oxyd of lead, and hence it is probably essentially the same with Goulard's extract of lead.

The manufacture of acetat of lead, is conducted more economically when the oxyd is dissolved in the acid at the same time that it is prepared; which is done by alternately exposing plates of lead to the vapour of acetic acid, and immersing the plates, thus covered with oxyd, into the acid itself.

Acetat of lead has a sweet styptic taste. It has a white colour, and crystallizes in flat parallelopipeds, terminated by a wedge, or more commonly, in shining needles. It is soluble in water, and in alcohol; effloresces slightly in the air, and is decomposed by heat and light. It is also decomposed by the alkalies, and most of the earths and acids.

Medical use.—The internal use of acetat of lead, has of late been much greater than formerly, and it promises to be a most valuable addition to our list of active remedies, although Dr. Duncan and others, have proscribed it from internal use. It has been successfully employed in several cases of epilepsy.* It is strongly recommended in cases of hemorrhage. It forms a very valuable external application in superficial and phlegmonic inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, as to the eyes, or by means of cloths soaked in it, or mixed with bread-crumb. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetic acid will be necessary to keep the lead in solution.

PLUMBI SUB-ACETAS LIQUIDUS. *A.*

Liquor Sub-Acetatis Lithargyri. *D.*

Liquor Plumbi Sub-Acetatis. *L.*

Liquid Sub-Acetat of Lead. Solution of Sub-Acetat of Lead.

Goulard's Extract.

Take of
 Semivitrified oxyd of lead, ... two pounds;
 Purified, or distilled vinegar, . . . one gallon.
Mix, and boil down to six pints, constantly stirring; then set it by, that the feculencies may subside, and strain.

Mr. Phillips thinks, that too much litharge is employed by the London college in this preparation, as a gallon of distilled vinegar, specific gravity 1.007, will dissolve only ten of the twenty-four ounces ordered, and the residuum having its bulk much increased by the action of the acid, retains much of the solution. When properly prepared, it is of a straw colour, with a slight admixture of green, and has a specific gravity of 1.22, and it is not, as said by Dr. Powell, "a dense solution of a deep brown colour," unless the acid which remains after the distillation of vinegar, be employed instead of the distilled vinegar.

Notwithstanding Scheele showed that a solution of sugar of lead was converted into Goulard, by allowing it to act for a day on a plate of lead, yet, until the experiments of Dr. Bostock, it was generally believed, that these preparations did not differ, except in the accidental variations of strength to which the latter was subject. By his

* Philadelphia Medical Museum, Vol. I. and II.

analysis, however, it appears, that the constituents in the saturated solution of the sugar of lead, and of the water of acetated litharge, are respectively,

	Acetat.	Goulard.
Oxyd of lead, - - -	16.8	23.1
Acetic acid, - - - -	7.5	5.
Water, - - - -	75.7	71.9
	100.	100.

Thenard obtained the salt in crystallized plates, by boiling 150 parts of litharge in a solution of 100 parts of sugar of lead; and on analysing it, found it to consist of 17 acid, 78 oxyd, and 5 water. These experiments, the coincidence of which confirm their accuracy, show, that in sugar of lead, 100 parts of acid are combined with 224 of oxyd of lead, and in Goulard's extract, with 450 or 460, or somewhat more than twice the quantity of oxyd. Now, according to the doctrine of definite proportions, any acid always combines with the same proportion of oxygen in oxyds, whatever the proportion of metal may be: it is therefore evident, that the oxygen in the oxyd of lead, contained in Goulard's extract, is combined with twice as much lead as it is in the oxyd in the sugar of lead; or Goulard's extract is the acetat of the protoxyd of lead, and sugar of lead the acetat of the peroxyd of lead.

Liquor Sub-Acetatis Lithargyri Compositus. *D.*

Compound Liquor of Acetated Litharge.

Take of
Liquor of acetated litharge, . . . a drachm;
Distilled water, ... fourteen ounces;
Weaker spirit of wine, ... a drachm.
Mix the spirit and liquor of acetated litharge, then add the distilled water.

PODOPHYLLUM. *A.* Podophyllum Peltatum.

May-Apple. Mandrake, &c. The Root.

This plant is very common throughout North America. The fruit is esculent and by many thought delicious. The leaves are poisonous. The root is an excellent purgative in doses of 20 grains. It is most advantageously used in combination with calomel, or crystals of tartar. An extract from the root is also sometimes employed, and has been found useful in colica pictonum. This plant is thought by some, to be especially adapted as a purge, to cases of intermittents, remittents, and dropsy. The root also often operates as an anthel-

mintic, and as such it is used by the Cherokee, and other southern Indians. The late Dr. Barton thought this plant possessed some narcotic quality.

The best time for gathering the May-apple, for medical purposes, is the autumn, when the leaves have turned yellow, and are about falling off. The Indians dry it in the shade, and powder it for use.*

The following experiments with the leaves of the podophyllum, are given from the thesis of Dr. F. H. Snow, a graduate of this School in 1819.

Two ounces of leaves to a quart of water, boiled and simmered to eight ounces. At nine o'clock, half was given to a full grown dog, and in thirty minutes the remainder. In ten minutes after the last, the pulsation of the heart was very weak, and from fifty to fifty-five per minute; a copious salivation was produced; increased at twelve, but no narcotic effect; at ten and twelve vomited; next morning he was found dead; the vomiting having been almost incessant from twelve until he died.

One drachm of the leaves in powder produced restlessness for a short time in a dog, when he appeared as well as usual.

Two ounces and a half of the leaves were made into an extract weighing six drachms, which was formed into pills of two grains each.

Two grains taken; pulse naturally 76.

minutes,	5	10	15	35	60
strokes,	76	76	76	70	65

continued so about two hours.

Four grains taken; pulse seventy-four, full and strong.

minutes,	5	10	15	20	25	30	35	40	45	50	55	60	65	70
strokes,	75	74	75	72	67	73	65	65	67	64	64	61	61	62

In two hours after, sixty-one; weak and small.

Three pills; pulse seventy-six, full and strong; at 10 A. M.

minutes,	5	10	15	20	25	30	35	40	45	50	55	60
strokes,	77	77	70	70	70	72	66	64	64	62	64	64

In two hours, the same; small and feeble; accompanied with slight nausea.

To Mr. E. affected with severe cough for some time, accompanied with remitting fever; pulse quick and tense; two grains of the *leaves* every three hours; second day the pulse still tense, four grains given; third day complete intermission of the pulse, and permanent cure.

Mrs. W. with pleurisy; a small bleeding had previously been made; pulse full; six grains of the leaves every two hours; on the fourth day, perfectly restored.

* Barton's Collections, Part 1. p. 30. 38.

POLYGALA SENEGA. *E. L. D.* SENEGA. *A.*

Seneka or Rattle-Snake Root. The Root.

Diadelphia Octandria.—Nat. ord. *Lomentaceæ.*

Seneka is a perennial plant, which grows wild in North America, particularly in Virginia and Pennsylvania. This root is usually about the thickness of the little finger, variously bent and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears; a kind of membranous margin runs on each side, the whole length of the root.

The root was first introduced into use in 1739, by Dr. Tennent, of Virginia, who wrote a pamphlet on the subject, and highly extolled it as a remedy for many complaints, and particularly, as a specific for the cure of the bite of the rattle-snake.

The bark is the active part of the root. Its taste is at first acrid, afterwards very hot and pungent. It has no smell.

Its acrimony resides in a resin; for it is entirely extracted by alcohol; is precipitated by water; does not rise in distillation; and is not destroyed by keeping.

Medical use.—It is an active stimulus, and increases the force of the circulation, especially of the pulmonary vessels. It has therefore been found useful in typhoid inflammations of the lungs; but it is apt to disorder the stomach, and to induce diarrhœa. Dr. Brandreth, of Liverpool, has derived great benefit in some cases of lethargy from an extract of seneka combined with carbonat of ammonia.

Some have likewise employed this root in hydropic cases, and not without success. There are examples of its occasioning a plentiful evacuation by stool, urine, and perspiration; and by this means removing the disease, after the common diuretics and hydragogues had failed.

It sometimes induces salivation, and it possesses diuretic, emetic, cathartic, expectorant and diaphoretic powers. It has become greatly celebrated in the cure of cynanche trachealis, and is used by the Indians in syphilis and malignant sore throat. The Polygala sanguina, a new species discovered at Savannah, has been used as a substitute for it.*

Dr. Archer, of Maryland, discovered the great utility of seneka snake-root, as a remedy for that fatal disease, the *croup*, and speaks with confidence as to the general good effects produced by it. The decoction of the root is the manner in which he generally gives it; the strength must be determined by the physician; it must be so strong, as to act sensibly on his own mouth and throat, in exciting coughing, &c. for in this disease, the larynx (mouth of the wind-pipe) in a manner loses its natural sensibility. Half an ounce of the root of seneka, bruised, and simmered in a close vessel, in half a pint of water, until reduced to four ounces, will, probably, in most cases, be sufficiently strong. A tea-spoonful of this to be given every hour or

* Barton's Collections, Medical Repository, &c.

half hour, as the urgency of the symptoms shall demand; and during these intervals, a few drops occasionally, to keep up a sensible action of the medicine, in the mouth and throat, until it acts as an emetic and cathartic; then repeat in small quantities, and so frequently as to keep up a constant stimulus in the same. By these means, in the course of two, four, six, or eight hours, a membrane is oftentimes discharged by the mouth, one, two, and often three inches in length; sometimes it is swallowed and voided by stool.

Patients who use the medicine, should not be permitted to drink any thing whatever, for some minutes after each dose. The reason must be obvious to all. The powder has lately been used by Drs. Archer and Son, in doses of four or five grains, mixed with a little water, with effects equally as pleasing as the decoction, and more so, unless the latter have been carefully prepared. It should be remarked that this powerful stimulant cannot with safety be exhibited during the inflammatory stage of croup. It is in the last stage only, that it has been found extremely useful in exciting the vessels of the trachea and lungs to a powerful excretion.

Seneka has been usefully employed in the decline of pleurisies and catarrhs, to promote expectoration. In suppressed coughs of aged persons, and in asthma, it is doubtless useful; a gentle and constant stimulus on the throat should be kept up in these diseases. It has also been exhibited as a powerful remedy in cases of female obstructions. Professor Chapman has found it of great utility in obstinate amenorrhœa, when given in decoction prepared by adding an ounce of the root to a pint of boiling water, which is slowly reduced by simmering to the quantity of one third. Four ounces of the decoction is to be taken during the day, increasing it when the menstrual effort is expected, as far as the stomach will allow. If this excite nausea, he adds aromatics. To prevent disgust, it is omitted a week or two in the intervals of the menstrual periods.

POLYGALA RUBELLA. *A.* (*Secondary.*)

Bitter Polygala. The Plant.

From the experiments of Professor Bigelow, this plant appears to be a strong and permanent bitter, imparting its sensible properties both to spirit and water. In small doses, its infusion is a useful tonic and stimulant to the digestive organs; in large doses it is diaphoretic. It is an article which may probably be well dispensed with in our Materia Medica.

POLYGONUM BISTORTA. *E. L. D.*

Great Bistort, or Snakeweed. The Root.

This plant is perennial, and grows wild in moist meadows in several parts of Britain. The root is about the thickness of the little

finger, of a blackish-brown colour on the outside, and reddish within: it is writhed or bent vermicularly (whence the name of the plant) with a joint at each bending, and full of bushy fibres; the root of the species here mentioned has, for the most part, only one or two bendings; others have three or more. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

Medical use.—It is employed in all kinds of immoderate hemorrhagies and other fluxes, both internally and externally, where astringency is the only indication. It is certainly a very powerful styptic, and it is to be looked on simply as such. To the sudorific, antipestilential, and other virtues attributed to it, it has no other claim than in consequence of its astringency. The largest dose of the root in powder is one drachm.

POLYPODIUM. *A.* (*Secondary.*)

POLYPODIUM FILEX MAS. *D.* ASPIDIUM FILEX MAS. *L. E.*

Male Fern. Male Shield Fern. The Root.

This fern is perennial, and grows in great abundance in almost every part of Britain where the ground is not cultivated. The greatest part of the root lies horizontally, and has a great number of appendages placed close to each other in a vertical direction, while a number of small fibres strike downwards. The large root, together with its appendages, are to be reserved for use. The two ends, however, are to be cut off, the one being too old and spongy, the other too new and green.

When chewed, its taste is somewhat mucilaginous and sweet, and afterwards slightly astringent and bitter. Its smell is also weak.

Medical use.—This root was used as an anthelmintic in the days of Dioscorides. It gradually became neglected; but its use was again revived at different times by Madame Nuffer, Herrenschwand, and others, who certainly frequently succeeded in killing and expelling the tænia, both lata and cucurbitina, by the exhibition of secret remedies, of which the fern-powder was, or rather was supposed to be, the principal ingredient; for there is much reason to believe, that the active purgatives with which it was always combined, were really the remedies which effected the cure.

The same, or nearly a similar secret, has been bought by different potentates, and published for the benefit of those suffering under this obstinate disease.

The internal solid part of the root only is to be powdered, and the powder should have a reddish colour; and as the dose and exhibition of the remedy must be regulated according to the age, sex, and

constitution of the patient, it must be given always under the direction of an experienced practitioner.

POTASSA.—*POTASS.*

Alkalizable metals. The heavier earths, and even the alkalies, had long been supposed by different chemists to be metallic oxyds, and were even stated to have been reduced to their metallic form. But their supposition rested only on the vaguest analogies, and their experiments were completely fallacious. The merit of discovering the metallic bases of the earths and alkalies belongs to Sir H. Davy, to whose ingenuity and skill, in applying the powerful agency of galvanism, we are indebted for the most unexpected conclusions ever obtained in experimental chemistry.

Potassium, the base of potass, is a white metal, brittle and crystallized; in its section resembling polished silver; and at 150° perfectly fluid, very much resembling quicksilver. At a red heat it is converted into vapour. Its specific gravity is between 8 and 9, water being 10. Exposed to the air, it attracts oxygen, and becomes covered with a crust of potass; when gently heated, it burns with an intense heat, and a red light. It explodes and inflames with water, and even with ice. It acts upon all bodies containing water or much oxygen. It burns vividly in chlorine. It is soluble in hydrogen gas, forming a compound which inflames with atmospheric air. It combines with sulphur and phosphorus, and the metals, forming readily oxydizable compounds.

Protoxyd of potassium scarcely known; of a greyish colour, effervesces with water without inflaming.

Potassa, (Sir H. Davy), a difficultly fusible substance, of a grey colour, vitreous in its fracture, dissolving in water, without effervescence, but with much heat, forming an alkaline solution.

Potass (hydrat of potassa) is a solid white substance, containing 90 potassa and 17 water, which cannot be separated by heat; extremely acrid to the taste; unctuous to the feel, but highly caustic; destroying the skin, and dissolving all soft animal substances. It is deliquescent, and soluble in half its weight of water at 58° Fahrenheit; it is fusible, and may be vaporized, but is perfectly incombustible; it is capable of crystallizing into very long quadrangular, compressed prisms, terminated by sharp pyramids; it changes vegetable blues to green, and combines with all the acids, oils, sulphur, sulphureted hydrogen, and the earths. It is obtained from the ashes of vegetables, and exists in some minerals. *Officinal.*

Orange oxyd of potassium, fusible, the result of the slow combustion of potassium in oxygen or air. It supports the combustion of inflammable bodies, supplying the oxygen. It is decomposed by water and carbonic acid, oxygen being evolved.

Chloride of potassium (muriat of potass). When muriatic acid and solution of potass are mixed and heated to redness, the hydrogen of the acid and the oxygen of the alkali are set free as water, while the metal and the chlorine combine to form the substance known by the name of muriat of potass. Chlorine also decomposes potassa and the orange oxyd, expelling its oxygen, and potassium attracts chlorine from hydrogen and phosphorus.

AQUA POTASSÆ. *A. E.*

LIQUOR POTASSÆ. *L.* AQUA KALI CAUSTICI. *D.*

Solution of Potass. Solution of Caustic Kali.

LIXIVIUM CAUSTICUM. *Caustic Ley.*

Take of
Fresh burnt lime, ... eight ounces;
Carbonat of potass, ... six ounces.

Put the lime into an iron or earthen vessel, with twenty-eight fluid ounces of warm water. After the ebullition is finished, instantly add the salt; and having thoroughly mixed them, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, the throat of which is stopped with a piece of clean linen. Cover the upper orifice of the funnel, and insert its tube into another glass vessel, so that the solution of potass may gradually drop through the rag into the lower vessel. As soon as it ceases to drop, pour into the funnel some ounces of water, but cautiously, so that it may swim above the matter in the funnel. The solution of potass will again begin to drop, and the effusion of water is to be repeated in the same manner, until three pints have dropped, which will happen in the space of two or three days; then mix the superior and inferior parts of the liquor together by agitation, and keep it in a well-stopped phial.

Specific gravity, to distilled water, as 1100 to 1000.

The processes of the colleges do not differ materially. They are founded upon the affinity of lime being stronger than that of potass for carbonic acid. Of course, when lime comes in contact with carbonat of potass, the carbonic acid quits the potass to unite with the lime, and the results of the mixture are potass and carbonat of lime. Now, as the carbonat of lime is insoluble in water, and the potass is very soluble, they may be separated by filtration. In doing this, however, we must take care to employ instruments on which the solution of potass does not act, and to prevent the free access of air, from which it would attract carbonic acid, and thus frustrate the whole operation. The latter object is attained by covering the upper or broad end of the funnel with a plate of glass, and inserting the lower end into the neck of a phial, which it fits pretty closely. The former object is attended with greater difficulties, and indeed scarcely to be effected, so powerful and general is the agency of

potass. All animal substances are immediately attacked and destroyed by it; therefore, our filters cannot be made of silk, woollen, or paper which contains glue; and although neither vegetable matters nor silica entirely escape its action, linen and sand are, on the whole, the least objectionable. A filter of sand was used by Dr. Black: he first dropt a rugged pebble into the tube of the funnel, in some part of which it formed itself a firm bed, while the inequalities on its surface afforded interstices of sufficient size for the passage of the filtering liquor. On the upper surface of this stone he put a thin layer of lint or clean tow; immediately above this, but not in contact with it, he dropped a stone similar to the former, and of a size proportionate to the swell in the upper part of the tube of the funnel. The interstices between this second stone and the funnel were filled up with stones of a less dimension, and the gradation uniformly continued till pretty small sand was employed. Finally, this was covered with a layer of coarser sand, and small stones to sustain the weight of the fluid. A filter of sand being thus constructed in the funnel, it was washed perfectly clean, by making clean water pass through it, till it dropt from the lower extremity of the funnel perfectly clear and transparent; and before using it, it was allowed to stand for some days, that no water might remain among the insterstices of the sand.

From the spongy nature of the residuum which remains upon the filter, and especially if we use that of sand, a considerable quantity of the solution of potass will be retained. It is, however, easily obtained, by pouring gently over it, so as to disturb it as little as possible, a quantity of water; the ley immediately begins again to drop from the funnel, and as, from the difference of their specific gravity, the water does not mix with it, but swims above it, the whole ley passes through before any of the water. By means of the taste we easily learn when the whole ley has passed.

As it is natural to suppose that the strongest solution will pass first, and the weakest last, we are directed to agitate the whole together, to render their strength uniform.

If the solution of potass be pure, it will be colourless, and it will neither effervesce with acids, nor form a precipitate with carbonat of potass. If it effervesces, carbonic acid is present, and must be separated by again boiling the solution with a little lime, or by dropping into it lime-water, as long as it produces any precipitate. But Mr. Phillips has remarked, that even when a small quantity of carbonic acid is contained in it, no precipitate is produced unless a considerable quantity of lime-water be added. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be separated by dropping into the ley a solution of the carbonat of potass. When we have thus purified our solution of potass, it must be again filtered. Mr. Phillips objected to this process as in the London Pharmacopœia of 1809, that the quantity of lime employed was much too large, and that a half of the weight

of the subcarbonat is sufficient, as in fact 33 parts of lime will saturate the 26 of carbonic acid commonly contained in 100 parts of subcarbonat of potass; and his suggestion has been adopted in the edition of 1815. But this objection is obviated by the mode of filtration used by the Edinburgh College; and although from calculation the quantity of lime seems excessive, it is necessary to render the potass perfectly caustic.

Medical use.—The solution of caustic potass, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent, are now, in some degree, explicable, since it has been discovered that urinary calculi are very different in their natures, so that some of them are only soluble in acids, and others only in alkalies. Of the last description are the calculi of uric acid, which are very frequent, and those of urat of ammonia. On these, therefore, alkalies may be supposed to make some impression; and that alkalies, or alkaline carbonats, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is, however, said, that their continued use debilitates the stomach; and M. Fourcroy has proposed applying the remedy immediately to the disease, by injecting into the bladder a tepid solution of potass or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated, and allowed to settle. If, on the addition of a little muriatic acid, a precipitate be formed, we shall have reason to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline solutions may also be taken into the stomach as antacids, but we possess others which are preferable.

Mr. Brandish, who has strongly recommended the solution of caustic potash for the cure of scrofula, gives the following complicated formula for its preparation.

Take of
American pearl ashes, ... six pounds;
Fresh burnt lime,
Fresh ashes of ash wood, each, . . . two pounds;
Boiling water, ... six gallons.

He reverses the common method of slaking lime, by desiring it to be gradually added to the water kept boiling: he then adds the pearl ashes, then the wood ashes; stirs all together, and lastly draws off the clear liquor slowly. He used to prepare it without the pearl ashes, but found they rendered it softer, which no doubt they would, as the quantity of lime is insufficient to abstract all the carbonic acid, and would leave the liquor in a state of subcarbonat. He says that a wine pint of his solution should weigh 18 or 19 ounces. He recommends the addition of a drop or two of genuine oil of juniper

to the pint of liquor, and orders it to be taken twice a day in the following doses: to a child from four to six, one drachm by measure; from six to eight, one drachm and a half; eight to fifteen, two drachms; fifteen to eighteen, two and a half; to adults, three and sometimes four. It should, however, be begun in rather smaller doses. The vehicle may be fresh beer, malt-tea, barley-water, or water-gruel.

Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodic diseases, or concentrated as a caustic, to destroy the poison of the viper, and of rabid animals.

POTASSA. *A. E.*

Potassa Fusa. *L.* Kali Causticum. *D.*

Potass. Melted Potass. Caustic Kali.

Take of

The solution of potass, any quantity.

Evaporate it in a covered very clean iron vessel, till, on the ebullition ceasing, the saline matter flow gently like oil, which happens before the vessel becomes red. Then pour it out on a smooth iron plate; let it be divided into small pieces before it hardens, and immediately deposited in a well-stopped phial.

The principal thing to be attended to in this operation, is to conduct the evaporation so rapidly that the ley shall not absorb any carbonic acid from the atmosphere. As long as any water of solution remains, the ebullition is evident, and the evaporation is to be continued until it cease. The heat is then to be increased a little, which renders the potass perfectly fluid, and gives it the appearance of an oil, when it is ready to be poured out either on a slab, as directed by the colleges, or into iron moulds, such as are used for the melted nitrat of silver.

The potass prepared according to these directions is sufficiently pure for medical use, but is not fit for chemical experiments. We can, however, obtain it perfectly white and crystallized, according to Berthollet, by adding to the ley, when evaporated so far that it would assume the consistence of honey, if permitted to cool, a quantity of alcohol equal to one-third of the carbonat of potass operated on, mixing them together, and letting them boil a minute or two. The mixture is then to be poured into a glass vessel, and corked up, when the impurities will gradually subside, partly in a solid form, and partly dissolved in water. The supernatant alcoholic solution is then to be evaporated rapidly, till its surface become covered with a black crust, which is to be removed, and the liquid below is to be poured into a porcelain vessel, when it will concrete into a white substance, which is to be broken in pieces, and immediately excluded from the action of the air.

A less expensive way of obtaining potass perfectly pure is that of

Lowitz. Evaporate a solution of potass till a thick pellicle form on its surface; allow it to cool, separate all the crystals formed, as they consist of foreign salts: renew the evaporation, in an iron or silver bason; and remove the pellicles, which form on the surface, with an iron skimmer, as long as any appear. When the ebullition ceases, remove the vessel from the fire, and agitate the fused salt with an iron spatula while it cools. Dissolve the saline mass in twice its weight of water, and evaporate in a silver bason till it begins to crystallize. The crystals are pure potass. The fluid which swims over them has a dark brown colour, and must be poured off: but if kept in a close-stopt phial, it will deposite its colouring matter, and by evaporation will furnish more crystals of potass.

Medical use.—Potass is only used as a caustic, or to form solutions of a known strength; and even its use as a caustic is inconvenient, from its being so quickly affected by the air, and from its rapid deliquescence, which renders it apt to spread.

POTASSA CUM CALCE. *A. E. L.*

Kali Causticum cum Calce. *D.*

Potass with Lime. Caustic Kali with Lime.

Take of
  Solution of potass, any quantity.
Evaporate it in a covered iron vessel till one-third remains; then mix it with as much new slaked lime as will bring it to the consistence of pretty solid pap, which is to be kept in a vessel closely stopt.

The addition of the lime in this preparation renders it less apt to deliquesce, more easily managed, and milder in its operation than fused potass.

CARBONAS POTASSÆ IMPURUS. *A. E.*

Cineres Clavellati. *L. D.*

Pearl Ashes. Potashes. Impure Carbonat of Potass.

The potashes of commerce are sent to Britain from the shores of the Baltic and from America. They are prepared by lixiviating the ashes of vegetables in barrels, first with cold and then with hot water, filtering the ley, and evaporating it to dryness in an iron pot. In this state they still contain some vegetable matter, not perfectly incinerated, which gives them a brown or black colour. To destroy this, and render their colour purer, they are again burnt in a reverberatory furnace. They now get the name of pearl ashes; but even yet they are very impure, and often contain the sulphats of potass and of lime, and the muriat of potass. They are also frequently adulterated with vegetable ashes, sand, and sulphat of potass. The ashes are detected by their difficult and imperfect solution, the sand, by the precipitation of silica in a gelatinous form by the addition

of an acid, and the sulphat of potass by its crystallization. All vegetables which grow at a distance from the sea afford potashes by incineration; herbs give the largest proportion, then the leaves of trees, then shrubs, and woods the least. It formerly had the name of Fixed Vegetable Alkali, but it is also found, though much more sparingly, both in the animal and mineral kingdoms.

Vauquelin has given a table of the quantity of pure potass, and of heterogeneous matters, contained in 1152 parts of the different potashes of commerce.

	Potass.	Sulphat of potass.	Muriat of potass.	Insoluble residuum.	Carb. acid and water.
Russian potashes,	772	65	5	56	254
American do.	857	154	20	2	119
Pearl ashes,	754	80	4	6	308
Potashes of Treves,	720	165	44	24	199
Dantzick ashes,	603	152	14	79	304
Potashes of Vosges,	444	148	510	34	304

The potass was estimated by the quantity of diluted nitrous acid saturated by it; the sulphat of potass by the precipitate formed with nitrat of baryta; and the muriat of potass by that formed with nitrat of silver.

All these different potashes, except the last, may be purified sufficiently for pharmaceutical purposes, by lixiviating them with a small proportion of cold water, and evaporating the ley to dryness in an iron pot.

Medical use.—Carbonat of potass is used in form of lotion, in rachitic and some cutaneous diseases, and as a stimulant to the inactive state of the vessels in certain ulcers. It is used internally as a diaphoretic or diuretic, and of late in calculous complaints and diseases of the alimentary canal: but its continued use seldom fails to injure the constitution, or the intestinal canal.

POTASSÆ SUB-CARBONAS. *A. L. E.*

SUB-CARBONAS KALI. *D.* *Subcarbonat of Potass or Kali.*

Take of

Impure subcarbonat of potass, any quantity.

Heat it red hot in a crucible. Then triturate it with an equal weight of water, and after the feces have subsided, pour the liquor into a very clean iron pot; lastly, boil to dryness, stirring constantly towards the end of the process, to prevent it from sticking to the vessel.

In this state of sub-saturation with carbonic acid, potash generally occurs in the arts. The potash and pearl-ash of commerce, are *subcarbonats* of potash, of different degrees of purity. The quantity of carbonic acid, contained in these alkalies, may be learned by a very simple experiment. Put one or two hundred grains of the alkali into a Florence flask, and add a few ounce measures of water. Take

also a phial filled with dilute sulphuric acid, and place this, as well as the flask, in one scale. Balance the two, by putting weights into the opposite scale, and, when the equilibrium is attained, pour gradually the acid into the flask of alkali, till an effervescence no longer ensues. When this has ceased, the scale containing the weights will be found to preponderate. This shows that the alkali, by combination with an acid, loses considerably of its weight; and the exact amount of the loss may be ascertained, by adding weights to the scale containing the flask and phial, till the balance is restored.

As it is sometimes of importance to know what proportion of real alkali a given weight of potash or pearl-ash contains, the following mode of determining the strength is founded on the following property of carbonat of potash.

Subcarbonat of potash dissolves very readily in water, which, at the ordinary temperature, takes up more than its own weight.—Hence, when an alkali, which should consist almost entirely of subcarbonat of potash, is adulterated, as very often happens, with substances of little solubility, the fraud may be detected by trying how much of one ounce will dissolve in two or three ounce-measures of water. In this way an adulteration of one-third its weight of sulphat of potash has been detected. There are certain substances of ready solubility, however, which may be used in adulterating pearl-ashes, as common salt for example; and, when this is done, we must have recourse to the acid test for the means of discovery.

One hundred grains of potash unite with 42.42 carbonic acid to form the subcarbonat, which, therefore, contains per cent. according to Berard,

Potash, ...	70.21
Acid, ...	29.79
	100.

The composition of this salt is differently stated by other writers, viz:

	Acid.	Base.
By Dalton, 100 grains consist of . .	31.10	68.9
Dulong, ...	30.70	69.30
Dr. Wollaston, ...	31.71	68.29

POTASSÆ CARBONAS. *A.*

SUB-CARBONAS POTASSÆ PURISSIMUS. *E.* KALI E TARTARO. *D.*

Carbonat of Potass. Pure Subcarbonat of Potass. Kali from Tartar.

SAL TARTARI. *Salt of Tartar.*

Take of

Impure super-tartrat of potass, any quantity.

Wrap it up in moist bibulous paper, or put it into a crucible, and burn it into a black mass, by placing it among live coals. Having

reduced this mass to powder, expose it in an open crucible to the action of a moderate fire, till it becomes white, or at least of an ash-grey colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it towards the end of the process, with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, till the bottom of the vessel becomes almost red. Lastly, when the salt is grown cold, keep it in glass vessels well stopped.

POTASSÆ SUPER-CARBONAS. *A.*

CARBONAS POTASSÆ. *E.* POTASSÆ CARBONAS. *L.*

Super-Carbonat of Potass. Carbonat of Potass.

Bi-Carbonat of Potass.

Take of

Carbonat of potass, . . . one part;
Water, ... three parts.

Dissolve the carbonat of potass in the water; put the solution in the middle vessel of Nooth's apparatus, and pass through it a stream of carbonic acid gas, obtained from carbonat of lime and diluted sulphuric acid, until the deposition of crystals ceases; then collect the crystals, and dry them on bibulous paper.

Carbonat of potash, in the state which has been already described, is far from being completely saturated with acid. This sufficiently appears from its strongly alkaline taste. It may be much more highly charged with carbonic acid, by exposing a solution of one part of the sub carbonat in three of water, to streams of carbonic acid gas, in Nooth's machine, or other apparatus; when a solution of alkali, after this treatment, is very slowly evaporated, it forms regular crystals. According to Dr. Wollaston,* the quantity of acid in the bi-carbonat is exactly double that in the sub-carbonat. This he proves by disengaging the carbonic acid, from each, by a stronger acid, such as the sulphuric. One part of the bi-carbonat, thus treated, is found to give twice as much carbonic acid as the sub-salt. Berthollet† obtained 189 grains of carbonic acid from 500 of this salt; and as nearly as possible, the same quantity from 1000 grains of the salt, reduced by calcination to subcarbonat. Berard found, that 100 parts of potash are fully saturated by 85.86 carbonic acid. The following table exhibits the composition of the bi-carbonat, as stated by him, and by Dr. Wollaston. One hundred grains contain,

* Philosophical Transactions, 1808.

† Mém. d'Arcueil, ii. 470.

	Acid.	Base.	Water.
According to Berard,	42.01	48.92	9.07
Dr. Wollaston,	43.9	47.1	9.0

The atomic constitution, deducible from these proportions, is one atom of potash, two atoms of carbonic acid, and one atom of water.

The potash of commerce, we have already shown to contain a considerable proportion of foreign salts. By the process directed by the colleges, it is purified from those which are crystallizable; and, although it still contains muriat of potass and silica, it is sufficiently pure for the purposes of medicine. Mr. Phillips says, when prepared from pearl ash, it consists of about 26 carbonic acid, 71 potash and water, two muriat of potash, and one sulphat of potash, and a little silica.

The purest subcarbonat of potass, in common use, is that obtained by incinerating the impure supertartrat of potass, as all the substances it contains, except the potass, are decomposed by the heat. The tartaric acid and colouring matter are destroyed, and part of the carbonic acid, which is formed, unites with the potass.

But this salt, in whatever way obtained, is not strictly entitled to the appellation of carbonat, given it by the Edinburgh college; for it is not saturated with the acid, or rather it is a mixture of potass and carbonat of potass, in variable proportions. It is owing to the uncombined potass that it is still deliquescent, and in some degree caustic.

Subcarbonat of potass is easily saturated with carbonic acid, by exposing it, in solution, to the contact of the air for a considerable time, or more quickly, by making a stream of carbonic acid gas evolved from carbonat of lime by sulphuric acid, pass through a solution of it, or by distilling it with carbonat of ammonia, as proposed by Berthollet, and directed by the London college. The last is more expensive than the second, but it does not require any particular apparatus. M. Curadow has invented a cheaper mode of saturating potass with carbonic acid. He dissolves the potass in a sufficient quantity of boiling water, mixes it with as much dried tanner's bark as to make it pretty dry, and then exposes the mixture, in a covered crucible, to the heat of a reverberatory furnace for half an hour. By lixiviation and crystallization, the mixture affords beautiful permanent crystals of carbonat of potass. In this state it consists of about 43 acid, 40 potass, and 17 water. The saturation with carbonic acid is one of the best means of purifying the subcarbonat of potass; for it always separates silica from the uncombined alkali; and hence, perhaps, the employment of the subcarbonat from tartar is unnecessarily expensive.

Medical use.—Subcarbonat of potass is frequently employed in medicine, in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures; but it is used also by itself, in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution.

In the above names, &c. we see a singular instance of confusion. What one Pharmacopœia designates as a carbonat, another calls a sub, and another a super-carbonat. The subcarbonat of the American Pharmacopœia is improperly stated, as being "formerly salt of tartar," a designation which was appropriated to the carbonat prepared from super-tartrat of potass. A super-carbonat, in the real meaning of the term, seems incapable of existing in the form of crystals; and is only to be found in the state of solution, in the super-carbonated waters. The whole of these salts require revision in their nomenclature; although, fortunately, no evil can arise from their being mistaken for each other. This, however, is not the case as it respects the *aqua potassæ* of the American Pharmacopœia, as just treated of; and that preparation, by the same name, amongst the medicated waters of the same Pharmacopœia!

LIQUOR POTASSÆ SUBCARBONATIS. *A. L.*

AQUA SUBCARBONATIS KALI. *D.*

Solution of Subcarbonat of Potass. Solution of Subcarbonat of Kali.

Take of
Subcarbonat of potass, . . . one pound;
Distilled water, ... twelve fluid ounces.
Dissolve the subcarbonat of potass in the water, and filter through paper.

The preparation of the Dublin college is the old *Oleum tartari per deliquium*, and is a solution of carbonat of potass in a variable quantity of water; for, by exposure to the air, the subcarbonat attracts not only water, but carbonic acid. It is, therefore, improperly named. The name of the London college is correct, and the preparation nearly uniform in point of strength. Dr. Powell says, that the quantities ordered by the college, will commonly give a solution amounting to nearly 18 ounces in bulk.

AQUA SUPER-CARBONATIS POTASSÆ. *E.*

Solution of Super-Carbonat of Potass.

Take of
Water, ... ten pounds;
Pure carbonat of potass, . . . one ounce.
Dissolve, and expose the solution to a stream of carbonic acid, arising from
Carbonat of lime, in powder,
Sulphuric acid, each, . . . three ounces;
Water, ... three pounds, gradually and cautiously mixed.
The chemical apparatus invented by Dr. Nooth, is well adapted for this preparation. But, if a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

The colder the air, and the greater the pressure, the better will the solution be, which must be kept in well-corked vessels.

As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well-corked, and kept in a cool situation, with the head down, or laid on one side. It should be perfectly transparent, and have an acidulous, not at all alkaline, taste; and when poured out of the bottles, it should have a sparkling appearance.

Medical use.—In this solution, carbonat of potass is combined with excess of carbonic acid, by which means it is better adapted for internal use, as it is rendered not only more pleasant to the taste, but is less apt to offend the stomach. Indeed, it is the only form in which we can exhibit potass in sufficient doses, and for a sufficient length of time, to derive much benefit from its use in calculous complaints. It has certainly, been frequently of advantage in these affections, but probably only in those instances in which the stone consists of uric acid, or urat of ammonia: for, although supersaturated with carbonic acid, yet the affinity of that acid for potass is so weak, that it really operates as an alkali.

Six or eight ounces may be taken two or three times a day. It in general proves powerfully diuretic, and sometimes produces inebriation. The last effect is ascribed to the carbonic acid.

POTASSÆ ACETAS. *A. E. L.*

Acetas Kali. *D.* Sal Diureticus.

Acetat of Potass. Acetat of Kali. Diuretic Salt.

Take of

Pure carbonat of potass, . . . one pound.

Boil it with a very gentle heat, in four or five times its weight of distilled acetic acid, and add more acid at different times, till on the watery part of the preceding quantity being nearly dissipated by evaporation, the new addition of acid ceases to raise any effervescence, which will happen when about twenty pounds of acid have been consumed. It is then to be slowly dried. The impure salt remaining is to be melted with a gentle heat, for a short time, but no longer than necessary, and afterwards dissolved in water, and filtered through paper. If the liquefaction has been properly performed, the filtered liquor will be limpid; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat, in a very shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may be sooner dissipated. Lastly, the acetat of potass ought to be kept in a vessel very closely stopped, to prevent it from deliquescing.

This is both a troublesome and expensive preparation; for, when attempted to be made by simply evaporating to dryness, the salt has

always a dark unpleasant colour, which can neither be removed by repeated solution and crystallization, nor even by solution in alcohol. It is doubtful to what the colour is owing. It has been ascribed by some, to part of the acetic acid being decomposed by heat during the exsiccation of the salt: they accordingly recommend the evaporation to be conducted very gently, and the pellicles to be skimmed from the surface of the liquor as fast as they are formed; and in this way, they say, they have procured, at once, a very white salt. Others again, ascribe it to accidental impurities, contracted during the operation, and recommend the utmost attention to cleanliness, and the use of earthen vessels; while others ascribe it to some foreign matter, which rises in distillation with the last portions of the acetic acid, and therefore, direct, that only the first portions which come over, should be used, or that the acetic acid should be distilled with charcoal. The last opinion appears to be the most probable, since, when acetic acid procured from the distillation of an acetat is employed, a colourless solution is obtained, and solutions which become coloured, do not at the same time become alkaline. But, to whatever cause it be owing, the colour is most effectually destroyed by fusing the salt. The heat necessary to do this, decomposes the colouring matter; and on dissolving the fused mass in water, and filtering the solution, we find a fine light charcoal on the filter. But this fusion is attended with considerable loss; for part of the acetic acid itself is decomposed.

To ascertain the exact saturation, litmus and turmeric paper should be alternately employed. Mr. Phillips says, that rather more than 21 pints of distilled vinegar, of 1.007, are required to saturate 18 ounces of subcarbonat of potass.

The operator must be particularly careful, in melting it, not to use a greater heat, nor keep it longer liquefied, than what is absolutely necessary: a little should be occasionally taken out and put into water; and, as soon as it begins to part freely with its black colour, the whole is to be removed from the fire.

The exsiccation of the solution of the salt, after it has been fused, must be conducted very carefully, as it is exceedingly apt to be decomposed, which would render a new solution and exsiccation necessary. The test of its purity, by dissolving it in alcohol, as directed by the London college, is to discover if any of the acetic acid itself has been decomposed in the operation; for the carbonat of potass, which is in that case formed, is insoluble in alcohol.

To spare trouble and expense, attempts have been made to prepare acetat of potass with undistilled vinegar, and even with the residuum of the distillation of acetic acid; and they have been, to a certain degree, successful: but, as repeated fusion and crystallization are necessary to bring the salt to a certain degree of purity, it does not appear that they were more economical. But if, to acetat of potass, prepared with impure vinegar, we add a sufficient quantity of sulphuric acid, we obtain by distillation, an acetic acid of great strength, which forms a beautiful acetat of potass without fusion.

Lastly, this salt may be prepared by the decomposition of acetats; for example, of the acetat of lime, by tartrat of potass.

Acetat of potass has a sharp, somewhat pungent taste. It is deliquescent, and is soluble in about its own weight of water, at 60°, but Mr. Phillips says, in half its weight, at 40°. It is also, according to Dr. Powell, soluble in alcohol in four times its weight. It is decomposed by the stronger acids; by a decoction of tamarinds; by the sulphats of soda and of magnesia; by muriat of ammonia; by the tartrat of soda and potass; and by some metalline salts. Its acid is destroyed by a high temperature.

Medical use.—Acetat of potass, however prepared, provided it be properly made, is a medicine of great efficacy, and may be so dosed and managed, as to prove either mildly cathartic, or powerfully diuretic; few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A simple solution, however, of carbonat of potass in vinegar, without exsiccation, is perhaps, not inferior, as a medicine, to the more expensive salt. Two drachms of the alkali, saturated with vinegar, have produced, in hydropic cases, ten or twelve stools, and a plentiful discharge of urine, without any inconvenience.

POTASSÆ SULPHAS. *A. L. E.* SULPHAS KALI. *D.*

Sulphat of Potass. Sulphat of Kali. Vitriolated Tartar.

Sal de Duobus. Arcanum Duplicatum, &c.

Take of

The salt which remains after the distillation of nitric acid, two pounds;

Boiling water, two gallons.

Mix them together, that the salt may be dissolved; next, add as much subcarbonat of potass as may be requisite for the saturation of the acid. Then boil the solution until a pellicle appears upon the surface, and, after straining it, set it by, that crystals may form. Having poured away the water, dry the crystals upon bibulous paper.

This salt is very seldom prepared on purpose, as it may be obtained from the residuum of many other preparations, by simple solution and crystallization. For so strong is the affinity between sulphuric acid and potass, that they scarcely ever meet without combining to form this salt. All the sulphats, except that of baryta, are decomposed by potass and most of its combinations; and reciprocally, all the compounds of potass are decomposed by sulphuric acid and most of its combinations; and in all these decompositions, sulphat of potass is one of the products.

The greatest part of the sulphat of potass of commerce is obtained from the residuum of the distillation of sulphat of iron with nitrat of potass, by lixiviating it, supersaturating the solution with carbonat of potass, filtering it boiling hot, and allowing it to crystallize. The

liquor remaining after the precipitation of magnesia, is also a solution of sulphat of potass. It is also got in considerable quantities from the residuum remaining in the retort, after the distillation of nitrous acid; and all the colleges have given directions for obtaining it in this way, by simply saturating the excess of acid with subcarbonat of potass. Mr. Phillips says it would be more economical to saturate any unavoidable excess of acid by lime, and reject the sulphat of lime formed, as the sulphat of potass is not so costly as the carbonat of potass used to make it.

As the residuum of the distillation of nitrous acid may not always be at hand, the Edinburgh College also give a receipt for making this salt, by directly combining its constituents. It would have been more economical to have used a solution of sulphat of iron, in place of sulphuric acid, by which means not only an equally pure sulphat of potass would have been procured at less expense, but also a very pure carbonat of iron.

Sulphat of potass forms small, transparent, very hard crystals, generally aggregated in crusts, and permanent in the air. Their primitive form is a pyramidal dodecahedron with isosceles triangular faces meeting at the summit, at an angle of about 66.15, and the base 113.45. It has a bitter taste, is slowly soluble in water, requiring 16 waters at 60°, and 4 at 212°. It is not soluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat.

It consists of 32.8 acid, and 67.2 potash and water, according to Mr. Phillips. It is decomposed by the barytic salts; by the nitrats and muriats of lime and of strontia; by the tartrats partially; and by the salts of mercury, silver, and lead.

Medical use.—Sulphat of potass, in small doses, as a scruple or half a drachm, is an useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphat of soda, and seems to extend its action farther.

POTASSÆ SUPER-SULPHAS. *L.* *Super-Sulphat of Potass.* *Bi-Sulphat of Potass.* *Sal Enixum.*

Take of

The salt which remains after the distillation of nitric acid, two pounds;

Boiling water, four pints.

Mix, dissolve the salt, and filter. Then boil down to one-half, and set it aside to crystallize. Pour off the liquid, and dry the crystals on blotting paper.

This salt is acid to the taste, reddens vegetable blues, and effervesces with alkaline carbonats. Mr. Phillips found that 100 grains required 25 of dried subcarbonat of soda for saturation. It is directed by Lowitz to be prepared by mixing seven parts of sulphuric acid with the same quantity of water in a large matrass, and adding to the hot mixture, as quickly as possible, four parts of potashes in

fine powder. On cooling, the super-sulphat of potass shoots in fine large crystals, whose primitive form is an acute rhomboid of 74° and 106°. These are to be quickly washed in water and dried. This mode of directly preparing it, is, however, unnecessary, as it is produced in sufficient quantity in the distillation of nitric acid. Its preparation, however, is attended with some difficulty, and Mr. Phillips at first thought that there was no super-sulphat, as he only obtained from the residuum of the distillation of nitrous acid, sulphat, with acid adhering to it. From subsequent experiments, he is of opinion, that it may be made to yield super-sulphat, or sulphat, according as the solution is more or less concentrated. When the residual salt is dissolved in only about an equal weight of water, Mr. Phillips found it deposite on cooling super-sulphat of potass, without any appearance of pellicle; but if the solution be evaporated to a pellicle, according to the former directions of the college, the whole concretes into a solid mass; and when the solution is not perfectly concentrated, the crystals obtained are sulphat of potass. It is also with extreme surprise that we learn from Mr. Phillips, that on sending to Apothecaries' Hall, where at least the directions of the college ought to be minutely adhered to, what he received was a mixture of 58 sulphat of potass, with 42 nitrat of potass. With such an excessive quantity of acid as the college order in preparing nitrous acid, it is perfectly impossible that so much, if any, nitre could have escaped decomposition. This salt was formerly called *sal enixum* and *tartarus vitriolatus acidus.* It is soluble in two waters at 60°, and less than one at 212°. It consists of 37 parts of sulphat of potass, and 33 sulphuric acid.

It is used in its unrefined state by silversmiths, and is recommended by Lowitz for preparing acetic acid, by decomposing acetat of soda. It promises to be a valuable medicine, as enabling us to give sulphuric acid in combination with an aperient salt, and being less disagreeable and more soluble than the neutral sulphat.

SULPHAS POTASSÆ CUM SULPHURE; olim, SAL POLYCHRESTUS. *E.*

Sulphat of Potass with Sulphur, formerly *Sal Polychrest.*

Take of
 Nitrat of potass, in powder,
 Sublimed sulphur, of each, equal parts.

Mingle them well together, and inject the mixture, by little and little at a time, into a red-hot crucible: the deflagration being over, let the salt cool, after which it is to be put up in a glass vessel well stopped.

In this process the nitric acid of the nitrat of potass is decomposed by the sulphur, which is in part acidified. But the quantity of oxygen contained in the nitric acid, is not always sufficient to acidify the whole sulphur employed; therefore, part of it remains in the state of sulphurous acid, which is probably chemically combined

with part of the potass in the state of sulphite; for the whole saline mass formed is more soluble in water than sulphat of potass. It is crystallizable, and by exposure to the air gradually attracts oxygen, and is converted into sulphat, or perhaps super-sulphat of potass; for even when recently prepared, it is manifestly acid. But this preparation, like all those depending on the uncertain action of fire, is apt to vary. In some experiments which Dr. Duncan made to determine the state in which the sulphur existed in this salt, carefully prepared, it seemed to be sulphuric acid; for it neither gave out a sulphurous smell on the addition of sulphuric acid, nor was a solution of it precipitated by acids. In others the presence of sulphureted hydrogen was obvious; but in no instance could sulphur, in any notable quantity, be detected. Hence its Edinburgh name *sulphas potassæ cum sulphure*, and the mode of preparation proposed by some, of simply triturating these substances together, are manifestly incorrect. In its medical effects and exhibition, it agrees with sulphurous mineral waters, which contain a proportion of neutral salt.

SULPHURETUM POTASSÆ. *A. E. L.*

SULPHURETUM KALI. *D.*

Sulphuret of Potash. Sulphuret of Kali.

HEPAR SULPHURIS. *Liver of Sulphur.*

Take of
Sulphur, ... one ounce;
Sub-carbonat of potass, ... two ounces.

Rub them together, and heat the mixture in a covered crucible, over a gentle fire, until it is fused. Pour it from the crucible while hot, and after it has cooled, put it into a close stopped bottle.

There exists a very strong affinity between sulphur and potass, but they must be united in a state of perfect dryness; because, if any moisture be present, it is decomposed, and alters the nature of the product. If potass be employed as directed by the Dublin College, it will unite with the sulphur by simple trituration, and will render one-third of its weight of sulphur soluble in water. If carbonat of potass be used as directed by the other colleges, it is necessary to bring the sulphur into a state of fusion; it then acts upon the carbonat, and expels the carbonic acid. It is evident, that to combine with the same quantity of sulphur, a larger proportion of carbonat of potass than of potass is necessary; but the quantity ordered by the London College is certainly much too large. Göttling directs only one part of carbonat of potass to two of sulphur; and to save the crucible, he directs the mixture, as soon as it melts, to be poured into a heated mould, anointed with oil. The colleges also differ in the mode of conducting the process. The London and Dublin Colleges direct the alkaline salt to be projected upon the

melted sulphur. The fault of this process is, that there is a considerable loss of sulphur by sublimation, which is avoided if the substances be previously intimately mixed, and brought into fusion by a very gradual and cautious application of heat, according to the process of the Edinburgh College; but, if the fusion be not very cautiously performed, the sudden extrication of so large a quantity of carbonic acid gas, is apt to throw the melted matter out of the crucible, and may be attended with unpleasant consequences. La Grange projects one part of sulphur, on one and a half of potass in fusion, and keeps the compound melted half an hour before he pours it out. If the heat be too great, and the crucible uncovered, the sulphurous vapour is apt to inflame, but it is easily extinguished by covering it up. For the preparation of precipitated sulphur, Hermbstaedt proposes to obtain the sulphuret of potass, by heating together in a crucible, four parts of sulphat of potass with one of charcoal powder. The charcoal is converted into carbonic acid gas, and the sulphat into sulphuret.

Sulphuret of potass, properly prepared, is of a liver-brown colour, hard, brittle, and has a vitreous fracture. It has an acrid bitter taste, and the smell of sulphur. It is exceedingly prone to decomposition. It is deliquescent in the air, and is decomposed. It is very fusible, but a strong heat separates the sulphur by sublimation. The moment it comes in contact with water, there is a mutual decomposition. Part of the sulphur becomes acidified, deriving oxygen from the water, and forms sulphat of potass. Part of the hydrogen of the water decomposed, combines with another portion of the sulphur, and escapes in the form of sulphureted hydrogen gas: another portion of the hydrogen combines with a third portion of the sulphur, and remains in solution, united with the alkali, in the state of hydrogureted sulphuret of potass. By acids, sulphuret of potass is immediately decomposed, the acid forms a neutral salt with the potass, and the sulphur is separated.

AQUA SULPHURETI KALI. *D.* *Water of Sulphuret of Kali.*

Take of
Sublimed sulphur, ... half an ounce;
Liquor of caustic kali, . . . nine ounces, by measure.

Boil for ten minutes, and strain through paper. Keep the liquor in phials well corked.

The specific gravity of this liquor is 1120.

The Dublin College have substituted for the sulphuret of potass, a preparation whic[illegible]ly similar to a solution of it in water. When sulph[illegible]ed in a solution of caustic alkali, a portion of the water is decomposed; the oxygen forms, with some of the sulphur and potass, sulphat of potass, and the hydrogen with the remainder hydro-sulphuret of potass. The former being difficultly soluble, is precipitated and separated by filtration. The solution must

be well preserved from the action of the air, which gradually decomposes it, forming sulphat of potass.

Medical use.—Hydro-sulphuret of potass is an exceedingly nauseous remedy; but it is used internally as an antidote to metallic poisons, to check excessive salivations from mercury, and in cutaneous affections. Externally, it is used with success against tinea capitis, and in psora. It is one of the articles which is particularly recommended in croup, by one of the successful candidates for the prize proposed by Bonaparte for the best treatise on that disease.

Super Tartras Potassæ Impurus. *L. E.*

Tartarum. *D.* Tartarus Crudus.

Impure Super-Tartrat of Potass. Tartar. Wine Stone.

Tartar exists in verjuice and in must, and is deposited on the sides of the casks by repose, from which it is scraped some time before the next vintage, to prepare the casks to receive the new wine. The deepest coloured and coarsest wines generally give most tartar; and it gets the name of white or red tartar according to its colour.

It is purified by dissolving it in boiling water, and separating the earthy part by filtrating the boiling solution. On cooling the solution it deposits irregular crystals, containing the oily and colouring matters, which are separated by boiling the mass with a white clay. At Venice it is purified by dissolving it in water, and clarifying it with whites of eggs and ashes. The tartar thus purified, when crystallized, or in powder, is called Cream of Tartar.

Its crystals are small and irregular, and do not melt in the mouth, but feel gritty under the teeth. It has an acrid harsh taste. It is soluble in sixty times its weight of water at 60°, and in thirty at 212°. It is decomposed, and its acid is destroyed, by heat. It contains 23 parts of potass, according to Bergmann, and 33, according to Thenard.

Medical use.—The virtues of tartar are those of a mild, cooling, aperient, laxative medicine. It is much used in dropsy; and some allege that it has good effects as a deobstruent, in dropsy from scirrhus. Taken from half an ounce to an ounce, it proves a gentle, though effectual purgative. Given in smaller doses, and in solution, it often acts as a powerful diuretic.

POTASSÆ SUPER-TARTRAS. *A. L. E.*

Crystalli Tartari. *D.* Tartarus Purificatus.

Cremor Tartari. Super-Tartras Potassæ Purificata.

Super-Tartrat of Potass. Crystals of Tartar, and Cream of Tartar.

Tartaric acid combines with potass in two proportions; the one

forming a neutral, the other an acidulous salt. The last is here noticed; and as the tartaric acid so greatly predominates in it, it will be proper to introduce its general properties.

Tartaric acid varies in the forms of its crystals; its specific gravity is 1.5962; it is permanent in the air; it is decomposed by heat; it dissolves readily in water, and the solution is not decomposed by exposure, unless very dilute; it may be changed by nitric acid into oxalic acid. According to Fourcroy it consists of 70.5 oxygen, 19.0 carbon, and 10.5 hydrogen.

Tartrats, by a red heat, are converted into carbonats. The earthy tartrats are scarcely soluble in water: the alkaline tartrats are soluble; but when combined with excess of acid, they become much less soluble. The tartaric acid is capable of combining at the same time with two bases. When tartrats are digested in sulphuric acid, the tartaric acid is separated, and is recognized by forming a gritty precipitate with a solution of potass.

POTASSÆ TARTRAS. *A. L. E.* TARTRAS KALI. *D.*

Tartrat of Potass. Tartrat of Kali.

TARTARUM SOLUBILE. *Soluble Tartar.*

Take of

Carbonat of potass, . . . one pound;

Super-tartrat of potass, three pounds, or as much as may be sufficient;

Boiling water, ... fifteen pounds.

To the carbonat of potass dissolved in water, gradually add the super-tartrat of potass in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonat of potass has been added; then strain the cooled liquor through paper, and after due evaporation set it aside to crystallize.

The tartaric acid is capable of uniting with potass in two proportions, forming in the one instance a neutral, and in the other an acidulous salt. The latter is an abundant production of nature, but it is easily converted into the former, by saturating it with potass, or by depriving it of its excess of acid. It is by the former method that the colleges direct tartrat of potass to be prepared, and the process is so simple, that it requires little comment. For the sake of economy, we should come as near the point of saturation as possible: but any slight deviation from it will not be attended with much inconvenience. Indeed, it is perhaps advisable to leave a slight excess of acid, which, forming a small quantity of very insoluble salt, leaves the remainder perfectly neutral. The evaporation must be conducted in an earthen vessel, for iron discolours the salt. It is easily crystallized, and the crystals become moist in the air. It has an unpleasant bitter taste. It is soluble in four parts of cold water, and

still more soluble in boiling water, and it is also soluble in alcohol. It is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or other acid fruits; which is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry. It is also totally decomposed by lime, baryta, strontia, and magnesia, and partially by the sulphats of potass, soda, and magnesia, and by the muriat of ammonia.

Medical use.—In doses of a scruple, half a drachm, or a drachm, this salt is a mild cooling aperient: two or three drachms commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

TARTRAS POTASSÆ ET SODÆ. *A. E.*

Soda Tartarizata. *L.* Tartras Sodæ et Kali. *D.*

Tartrat of Potass and Soda.

Sal Rupellensis. *Rochelle Salt.*

Take of
 Subcarbonat of soda, ... twenty ounces;
 Super-tartrat of potass, ... two pounds;
 Boiling water, ... ten pints.

Dissolve the carbonat of soda in the water, and gradually add the super-tartrat of potass. Filter the solution through paper; evaporate until a pellicle be formed, and set it aside to crystallize. Pour off the liquor, and dry the crystals on blotting paper.

The tartaric acid in several instances is capable of entering into combination at the same time with two bases. In the present example, the superabundant acid of the super-tartrat of potass is neutralized with soda, and in place of a mixture of tartrat of potass and tartrat of soda, each possessing their own properties, there results a triple salt, having peculiar properties.

The tartrat of potass and soda forms large and very regular crystals, in the form of prisms with eight sides nearly equal, which are often divided longitudinally, almost through their axis. It has a bitter taste. It is soluble in about five parts of water, and effloresces in the air. It is decomposed by the strong acids, which combine with the soda, and separate super-tartrat of potass, and by baryta and lime. By heat its acid is destroyed. It consists of 54 tartrat of potass, and 46 tartrat of soda. Eighteen parts of subcarbonat of soda, will neutralize 24 of super-tartrat of potass.

Medical use.—It was introduced into medical practice by M. Seignette, an apothecary at Rochelle, whose name it long bore. It is still frequently employed; and though less agreeable than the phos-

phat of soda, it is much more so than the sulphat of soda. It is less purgative than these, and must be given in larger doses.

PRINOS. *A.* (*Secondary.*) Prinos Verticellatus.

Black-Alder. Virginian Winter-Berry. The Bark.

This is a very common shrub in many parts of the United States, and grows in the greatest perfection in swamps or marshy places. The bark is manifestly astringent. It is likewise considerably bitter and pungent. The berries greatly partake of the bitter quality, and if infused in wine or brandy, might be advantageously employed in cases where bitter tinctures are exhibited. The bark has been used as a substitute for Peruvian bark in intermittents and other diseases, both in substance and decoction. It is supposed to be chiefly useful in cases of great debility unaccompanied by fever; as a corroborant in anasarcous and other dropsies, and as a tonic in cases of incipient sphacelus or gangrene. It is both given internally, and employed externally as a wash. On many occasions, it appears to be more useful than the Peruvian bark; and the late Professor Barton says it ought to have a place in the shops, and in the Pharmacopœia of this country, when such a desideratum shall be supplied.*

Dr. Mease says (Philadelphia Medical Museum, vol. II.) it is useful in mortification, united with the root of sassafras, in decoction, &c.

PRUNA. *A.*

Prunus Domestica. *E. L. D.*

Plumb Tree. Prunes. French Prunes. The dried Fruit.

This tree is found wild in hedges in England, but has probably originated from the stones of the cultivated kinds being dropped there by accident. Great quantities of the dried fruit are imported from the continent, but the French prunes are reckoned the best.

Medical use.—They contain much mucilaginous and saccharine matter, and their medical effects are, to abate heat, and gently loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating cathartics would tend to aggravate: where prunes are not of

* Barton's Collections, Part II. p. 5.

themselves sufficient, their action may be promoted by joining with them a little rhubarb or the like; to which may be added some carminative ingredient to prevent their occasioning flatulency.

Prunus Lauro-Cerasus. *Cherry Tree Laurel. The Leaves.*

An exotic narcotic plant, not cultivated among us, but preserved in some hot-houses and botanic gardens as a curiosity. The leaves have an odour slightly fragrant: their taste is extremely bitter. They possess a highly narcotic quality, which is extracted by infusion in alcohol or water, and is even brought over by distillation in the state of an essential oil, which the water partly dissolves. And the very singular fact has been established, that the volatile principle in which the narcotic quality of this plant resides is the prussic acid. It had often been observed, that the odour of this acid is similar to that of the cherry-laurel, peach blossom, and bitter almond. Bohn found, that the distilled water of the bitter almond contained prussic acid. Schroeder discovered it in the distilled water of the peach blossom and cherry-laurel, prussiat of potass being obtained by distilling them from the alkali; and Bucholz succeeded in separating the prussic acid from the essential oil of the cherry-laurel, by agitation with an alkaline solution. This acid in its pure state has been further found to be highly narcotic; and the narcotic power of all these plants no doubt depends on it.

Cherry-laurel has ever been considered as a poison of the most deleterious energy, but it is now known, it may be administered internally with perfect safety. In the few instances of its trial it has been found to give tone to the stomach, increase the appetite, and to exhilarate. Dr. Mayer, of Naples, gives the distilled water of laurel for the cure of virulent gonorrhœa, and by his advice an American captain affirms, that he cured thirty sailors by this medicine alone. It appears to retard the pulse and produce some sedative effects. It has been found serviceable in phthisis pulmonalis on a few trials. Professor Wurzer, of Bonn, gave fifty drops of the laurel water three times in a day, which was very efficacious in hypochondriac and nervous complaints. He finds the laurel water diminishes the too great irritability of the heart and muscular fibre, and augments, at the same time, the action of the absorbent vessels. It is recommended by some German authors in hydrophobia. It may be given in saturated tincture, a few drops cautiously increased until some effect be observable.

This article is more fully considered under the head of *Cyanogen.*

PRUNUS VIRGINIANA. *A.* (*Secondary.*)

Wild Cherry Tree. The Bark.

This tree is very common. The bark has been found useful in intermittents. The leaves are poisonous to certain animals, and even

the berries intoxicate different kinds of birds. The Indians use the bark in the cure of syphilis. It is considerably bitter and astringent, and possesses some aromatic warmth, and likewise an evident narcotic quality. It is manifestly stimulant. The bark of the root seems most powerful.

It has been found useful in dyspepsia, consumption of the lungs and lumbar abscess, (see Medical Repository, vol. V. No. III.)

The distilled water of the leaves is a powerful poison to different animals, which seems dependant on the presence of the same principle which exists in peach kernels, &c. lately shown to be prussic acid. A strong decoction of the bark is anthelmintic.*

PTEROCARPUS.

PTEROCARPUS SANTALINUS. *E. L. D.* SANTALUM. *A.* (*Secondary.*)

Red Sanders. The Wood.

This tree grows in the East-Indies, and acquires a very large size. The wood is brought in large billets, of a compact texture, a dull red, almost blackish colour on the outside, and a deep brighter red within. It has no manifest smell, and little or no taste. It communicates a deep red to rectified spirit, but gives no tinge to aqueous liquors; a small quantity of the resin, extracted by means of spirit, tinges a large one of fresh spirit, of an elegant blood red. Neumann got from 960 grains 210 alcoholic, and afterward 20 of watery extract; and inversely, 126 tough watery extract, and 120 alcoholic. According to the same chemist, it gives out its colouring matter to volatile oil of lavender, but not to volatile oil of turpentine. Is this difference to be ascribed to the camphor contained in the former?

Although this article is classed in the secondary list, there is none, of which such frequent use is made in the American Pharmacopœia. Its only employment is to give a reddish tinge to some of the tinctures. Why this should be deemed essential, would be difficult to show. It adds nothing to the virtues of the preparation, and ought to be discarded entirely from the lists of the *Materia Medica*; if it must be retained, let an additional division be adopted of the *Materia Tinctoria*. We are averse to hanging out false colours in medicine. A remedy, like wine, should have for its motto, "good wine needs no bush."

* Barton's Collections, Part I. and II.

Pterocarpus Draco. *E.* Sanguis Draconis.

Dragon's Blood. A Resin.

This is also a very large tree. It is a native of South America, and the resin which exudes from incisions made in its bark, used to be frequently sent from Carthagena to Spain. It is, however, doubtful, if the dragon's blood of the shops be produced from this tree, as many others furnish a similar resin, as the dracæna draco, dalbergia monetaria, and especially the calamus draco, which probably furnishes all that is brought from the East-Indies.

The best dragon's blood is not in cakes, but is brought in small masses, of the size of a nutmeg, wrapt up in the dried leaves of some kind of reed, breaks smooth, free from any visible impurities, of a dark red colour, which changes, upon being powdered, into an elegant bright crimson. This drug, in substance, has no sensible smell or taste: when dissolved, it discovers some degree of warmth and pungency. It is fusible and inflammable, and totally soluble in alcohol, tinging a large quantity of the menstruum of a deep red colour. It is likewise soluble in expressed oils, and gives them a red hue, less beautiful than that communicated by anchusa. It is not acted on by water, but is precipitated by it from its alcoholic solution. Dr. Duncan found that it is soluble in nitrous acid and alkalies, and that it neither precipitates gelatin, nor affects the colour of the salts of iron. It therefore appears to be a pure resin without any astringency. He has been more particular in proving that this resin is not astringent, because both Mr. Murray and Dr. Thompson have adopted Mr. Proust's account of it. But the substance examined by Mr. Proust could not be the resin known in this country by the name of dragon's blood, as it was as soluble in water as in alcohol. Dr. Fothergill, who first described kino, received it as the finest dragon's blood. Something similar must have happened to Mr. Proust, as the characters of his *sang dracon* correspond with those of kino.

PULVERES.—*POWDERS.*

This form is proper for such materials only, as are capable of being sufficiently dried to become pulverisable, without the loss of their virtue. There are several substances, however, of this kind, which cannot be conveniently taken in powder; bitter, acrid, fetid, drugs are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixed alkaline salts deliquesce when exposed to the air; and volatile alkalies exhale. Many of the aromatics, too, suffer a great loss of their odorous principles when kept in powder; as in that form they expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a drachm; it rarely exceeds a whole drachm; and is not often less than a scruple. Substances which produce powerful effects in smaller doses are not trusted to this form, unless their bulk be increased by additions of less efficacy; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more consistent vehicle, as syrups; for from thin ones they soon subside: Resinous substances likewise are most commodiously taken in thick liquors; for in thin ones, they are apt to run into lumps, which are not easily again diffused.

Directions for Powders.

Substances to be powdered, previously dried, are to be pulverized in an iron mortar. The powder is then to be separated, by shaking it through a hair-sieve, and is to be kept in close vessels.

PULVIS ALOES CUM CANELLA. *A. D.*

Powder of Aloes with Canella. Hiera Picra.

Take of
Socotorine aloes, . . . one pound;
Canella, ... three ounces.
Pulverize them separately; then mix them.

This composition has long been known in the shops under the title of *Hiera picra.* It furnishes us with an useful aloetic purgative, the canella operating as a good corrigent for the aloes. But it is more frequently employed as the basis of electuaries, or pills.

Pulvis Aloes cum Guaiaco. *D.* Pulvis Aloes Compositus. *L.*

Powder of Aloes with Guaiacum. Compound Powder of Aloes.

Take of
Hepatic aloes, ... one ounce and a half;
Gum guaiacum, ... one ounce;
Aromatic powder, ... half an ounce.
Rub the aloes and gum guaiacum separately to powder; then mix them with the aromatic powder.

This also furnishes us with a useful purgative: but when taken only in small doses, its chief effect is that of promoting perspiration.

PULVIS AROMATICUS. *A. E. D.*

Pulvis Cinnamomi Compositus. *L.*

Aromatic Powder. Compound Powder of Cinnamon.

Take of
  Cinnamon,
  Cardamon,
  Ginger, each equal parts.
Rub them together to a fine powder, which is to be kept in a well stopped glass bottle.

This composition is an agreeable, hot, spicy medicine; and as such, may be usefully taken in cold phlegmatic habits and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the viscera. The dose is from ten grains to a scruple and upwards.

Pulvis Asari Compositus. *E. D.*

Compound Powder of Asarabacca.

Take of
  The leaves of asarabacca, ... three parts;
  The leaves of marjoram,
  Flowers of lavender, of each, . . . one part.
Rub them together to powder.

This is an agreeable and efficacious errhine, and superior to most of those usually sold under the name of *herb snuff*. It is often employed with great advantage in cases of obstinate head-ach, and of ophthalmias resisting other modes of cure. Taken under the form of snuff to the extent of five or six grains at bed time, it will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and likewise a copious discharge from the nose. It is, however, necessary, during its operation, to avoid exposure to cold.

PULVIS CALCIS CARBONATIS COMPOSITUS. *A. E.*

Pulvis Cretæ Compositus. *L.*

Compound Powder of Carbonat of Lime.

Compound Powder of Chalk.

Take of
  Prepared carbonat of lime, . . . four ounces;
  Nutmeg, ... half a drachm;
  Cinnamon, ... one drachm and a half.
Reduce them together to powder.

The addition of the aromatics in the above formula, coincides with the general intention of the remedy, which is indicated in weakness and acidity in the stomach, and in looseness from acidity.

Pulvis Cretæ Compositus cum Opio. *L.*

Compound Powder of Chalk with Opium.

Take of
Compound powder of chalk, . . . six ouuces and a half;
Hard opium, powdered, ... four scruples.
Mix them.

From the addition of the opium, this remedy becomes still more powerful than the preceding in restraining diarrhœa.

Pulvis Contrayervæ Compositus. *L.*

Compound Powder of Contrayerva.

Take of
Contrayerva, powdered, ... five ounces;
Compound powder of chalk, . . . one pound and a half.
Mix them.

This medicine has a very good claim to the title of an alexipharmic and sudorific. The contrayerva by itself proves very serviceable in low fevers, where the vis vitæ is weak, and a diaphoresis to be promoted.

PULVIS IPECACUHANÆ ET CUPRI SULPHATIS. *A.*

Powder of Ipecacuanha and Sulphat of Copper.

Take of
Ipecacuanha, in powder, . . . one scruple;
Sulphat of copper, ... five grains.
Rub them together.

This is an old prescription, much recommended by Dr. Senter, in certain cases of phthisis, &c. See Transactions of the College of Physicians of Philadelphia.

PULVIS IPECACUANHÆ ET OPII. *A. E.*

PULVIS IPECACUANHÆ COMPOSITUS. *L.*

Powder of Ipecacuanha and Opium.

Compound Powder of Ipecacuan. Dover's Powders.

Take of
Ipecacuan, in powder,
Opium, of each, ... one part;
Sulphat of potass, ... eight parts.
Triturate them together into a fine powder.

The sulphat of potass, from the grittiness of its crystals, is perhaps, better fitted for tearing and dividing the tenacious opium than any other salt: this seems to be its only use in the preparation. The operator ought to be careful that the opium and ipecacuanha be equally diffused through the whole mass of powder, otherwise different portions of the powder must have differences in degree of strength.

This powder is one of the most certain sudorifics, and, as such, was recommended by Dr. Dover as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy, and several other diseases, where it is often difficult by other means to produce a copious sweat. The dose is from five to twenty grains, according as the patient's stomach and strength can bear it. It is proper to avoid much drinking immediately after taking it, otherwise it is very apt to be rejected by vomiting, before any other effects are produced.

PULVIS JALAPÆ COMPOSITUS. *A. E.*

Compound Powder of Jalap.

Take of
Jalap root, ... one part;
Super-tartrat of potass, . . . two parts.
Grind them together to a very fine powder. *E.*

The use of the tartrat in this preparation, is partly to break down and divide the jalap; and therefore they are directed to be triturated together, and not separately.

PULVIS KINO COMPOSITUS. *L.* *Compound Powder of Kino.*

Take of
Kino, ... fifteen drachms;
Cinnamon, ... half an ounce;
Hard opium, . . . one drachm.
Reduce them separately to a very fine powder, then mix them.

This, though well known in extemporaneous prescription, is a new officinal preparation, and one which promises to be convenient. It is anodyne and astringent, containing one part of opium in twenty.

Pulvis Opiatus. *E.* *Opiate Powder.*

Take of
 Opium, ... one part;
 Prepared carbonat of lime, . . nine parts.
Rub them together to a fine powder. *E.*

In this powder the opium is the active ingredient; and it is immaterial whether the phosphat (as the London College directs) or carbonat of lime be used to promote its mechanical division.

Pulvis Salinus Compositus. *E.* *Compound Saline Powder.*

Take of
 Muriat of soda,
 Sulphat of magnesia, of each, . . . four parts;
 Sulphat of potass, ... three parts;
Dry the salts with a gentle heat, reduce them to fine powder separately, then rub them together, and keep the mixture in a well-corked phial.

However we may explain it, there is little doubt that mixtures of substances of similar characters have often a better effect than either of the ingredients singly. We have, perhaps, carried our simplifications too far, in rejecting all the old farragoes, as we chuse to call them. The mixture of salts acts very pleasantly in costive habits, being taken to the extent of a tea-spoonful in half a pint of water before breakfast.

PULVIS SCAMMONII COMPOSITUS. *A. E. L.*

Compound Powder of Scammony.

Take of
 Scammony,
 Super-tartrat of potass, each, equal parts.
Rub them together to a fine powder.

Pulvis Sennæ Compositus. *L.* *Compound Powder of Senna.*

Take of
  Senna,
  Crystals of tartar, of each, . . . two ounces;
  Scammony, ... half an ounce;
  Ginger, ... two drachms;
Triturate the scammony by itself, reduce the rest together into a powder, and then mix.

This powder is given as a cathartic, in the dose of two scruples, or a drachm. The spice is added, not only to divide, but to warm the medicine, and make it sit easier on the stomach. The scammony is used as a stimulus to the senna; the quantity of the latter necessary for a dose, when not assisted by some more powerful material, being too bulky to be conveniently taken in this form.

Pulvis Tragacanthæ Compositus. *L.*

Compound Powder of Tragacanth.

Take of
  Tragacanth, powdered,
  Gum arabic,
  Starch, of each, . . . an ounce and a half;
  Refined sugar, . . . three ounces.
Rub them together into a powder.

This composition is a mild emollient; and hence becomes serviceable in hectic cases, tickling coughs, strangury, some kinds of alvine fluxes, and other disorders proceeding from a thin acrimonious state of the humours, or an abrasion of the mucus of the intestines: they soften, and give a greater degree of consistency to the former, and defend the latter from being irritated or excoriated by them. All the ingredients coincide in these general intentions. The dose is from half a drachm to two or three drachms, which may be frequently repeated.

PYROLA. *A.* *Pyrola.* (*Secondary.*)

Pyrola Umbellata. Chimaphila Umbellata.

Ground-holly. Pippsiseva. Winter-green.

This is a very common North American plant, belonging to the same class and order as the uva ursi. The two plants are nearly allied to each other in botanical affinity, as well as in their medical properties.

It is considerably astringent, and was considered by Dr. Barton as highly worthy the notice of physicians. It has been used with advantage in the same cases in which uva ursi has been found beneficial. It has also been used with good effect in some cases of intermittents. In one case its diuretic operation was evident. The bruised leaves externally applied sometimes induce redness, vesication, and desquamation of the skin.*

PYRUS CYDONIA. *L.* *Quince.* *The Seeds.*

The quince is originally a native of Crete, but ripens its fruit perfectly in our climate.

Quinces have a very austere acid taste: taken in small quantity, they are supposed to restrain vomiting and alvine fluxes; and more liberally, to loosen the belly. The seeds abound with a mucilaginous substance of no particular taste, which they readily impart to watery liquors; an ounce will render three pints of water thick and ropy like the white of an egg. They will not however supply the place of gum arabic, because their mucilage spoils very quickly, and is precipitated by acids.

Q.

QUASSIA.

Decandria Monogynia.—Nat. ord. *Gruinales.*

QUASSIA. *A.* Quassia Excelsa. *E. L. D.*

Quassia. *The Wood, the Bark and Root.*

This tree grows in Jamaica, and in the Caribæan islands. The quassia of the shops is the wood of its root, and not of the quassia amara, which is a very rare tree, but surpasses all others in bitterness.

This root is about the thickness of a man's arm: its wood is whitish,

* Barton's Collections, Part II. p. 2. Mitchell's Inaugural Essay, on uva ursi, and pyrola umbellata.

becoming yellowish by exposure to the air. It has a thin, grey, fissured, brittle bark, which is deemed in Surinam more powerful than the wood. Quassia has no sensible odour, but is one of the most intense, durable, pure bitters known. Its infusion, decoction, and tincture, are almost equally bitter and yellowish, and are not blackened by chalybeates. The properties of the extract of quassia have been detailed by Dr. Thomson, under the title of the bitter principle.

Medical use.—It is a very pure and simple bitter, and may be given in all cases where bitters are proper. It has been exhibited in intermittent and bilious fevers, in stomachic complaints, in lienteria, in cachexy, dropsies, leucorrhœa, and gout. It is much used in Great Britain to give the bitterness to malt liquors, though it subjects those brewers who employ it to a very heavy penalty.

It can scarcely be reduced to a sufficiently fine powder to be given in substance, and is therefore generally given in the form of infusion, decoction, or extract.

QUASSIA SIMAROUBA. *E. L. D.* SIMAROUBA. *A.*

Simarouba. Mountain, or Bitter Damson. The Bark and Wood.

This tree grows in Guiana and in Jamaica. The simarouba of the shops is the bark of the root of this tree, and not of the quassia amara, as stated by the Dublin College. It is brought to us in pieces some feet long, and some inches broad, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable taste. It gives out its bitterness both to alcohol and water.

Medical use.—It has been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers; but it is doubtful that it is better than other bitters.

It is given in powder, in doses of half a drachm, or a whole drachm; but it is too bulky, and very difficultly pulverizable. It is best exhibited in decoction. Two drachms of the bark may be boiled in two pounds of water to one, and the decoction drunk in cupfuls in the course of the day.

QUERCUS.

Monoecia Polyandria.—Nat. ord. *Amentaceæ.*

QUERCUS ROBUR. *E. D.* QUERCUS PEDUNCULATA. *L.*

Common British Oak. The Bark.

The oak grows wild in Britain. The superior excellence of its wood for ship-building has rendered its cultivation an object of na-

tional concern. Its saw-dust is an useful dye-stuff, and its bark is the principal article used in tanning. M. Vauquelin has discovered a remarkable chemical difference between the bark and nut-galls, the latter precipitating tartrat of antimony and infusion of cinchona, which are not acted on by the former.

Medical use.—The bark is a strong astringent, and is recommended in hemorrhagies, alvine fluxes, and other preternatural or immoderate secretions. In these it is sometimes attended with good effects. But it is by no means capable of being employed as a substitute, in every instance, for Peruvian bark, as some have asserted; and indeed it is so difficultly reduced to a sufficiently fine powder, that it can scarcely be given internally in substance.

QUERCUS ALBA. *A.* *White Oak.* *The Bark.*

QUERCUS TINCTORIA. *A.* *Black Oak.* *The Bark.*

It is probable that all the species of oak, are more or less allied in medicinal properties. The efficacy of the black oak bark in intermittents has been long admitted; the late Professor Barton, used the bark of the Spanish oak (quercus rubra montana) in gangrene; and considered it equal in power to the best Peruvian bark.

R.

RANUNCULUS SCELERATUS. *Celery-leaved Crowfoot.*
RANUNCULUS BULBOSUS. *A.* (*Secondary.*)
Crowfoot. *Butter Cups.* *The Plant.*

The former of these is a very acrid plant; when bruised, and laid upon any part of the body, it will, in a few hours' time, raise a blister. It is a native both of Europe and America. The latter species possesses the same properties; it grows here very plentifully, but was thought by the late Dr. Barton not to be a native.*

* Collections, Part I. p. 23.

RHAMNUS. *A.* Rhamnus Catharticus. *E. L. D.*

Buckthorn. Purging Buckthorn. The Berries and their Juice.

This tree, or bush, is common in hedges: it flowers in June, and ripens its fruit in September, or the beginning of October. In the markets, the fruit of some other trees, as the black berry-bearing alder, and the dogberry tree, have, in England, been frequently mixed with, or substituted for, those of buckthorn. This abuse may be discovered by opening the berries: those of buckthorn have almost always four seeds, the berries of the alder two, and those of the dogberry, only one. Buckthorn berries, bruised on white paper, stain it of a green colour, which the others do not. Those who sell the juice to the apothecaries, are said to mix it with a large proportion of water.

Medical use.—Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable esteem as cathartics: and celebrated in dropsies, rheumatisms, and even in the gout: though in these cases they have no advantage above other purgatives, but are more offensive, and operate more severely, than many which the shops are furnished with. They generally occasion gripes, sickness, dry the mouth and throat, and leave a thirst of long duration. The dose is about twenty of the fresh berries in substance, and twice or thrice this number in decoction; an ounce of the expressed juice, or a drachm of the dried berries.

RHEUM.—*RHUBARB.*

Enneandria Monogynia.—Nat. ord. *Oleraceæ.*

RHEUM PALMATUM. *A. L. D.* *Palmated Rhubarb.*

Rheum Undulatum. *D.*

Rheum Russicum vel Turcicum.
——— Sinense vel Indicum.
——— Britannicum. } *E.*

Turkey, China, and British Rhubarb, got from the palmated and other species. The Root.

Both of these species grow spontaneously in China, and endure the colds of our climate.

But it is not ascertained that the Chinese or Russian rhubarb is the dried root of this plant. Pallas thinks that it is obtained indiscriminately from the rheum undulatum, palmatum, and compactum,

more especially from the first; while Mr. Sievers, an apothecary who was sent by Catherine II. on purpose to obtain the true rhubarb plant, and travelled for several years in the countries contiguous to that whence the rhubarb is brought, is of opinion that the botanical characters of the plant which furnishes it are still unknown, excepting that it is said not to grow to a great size, and to have round leaves, which are toothed on the edges with almost spinous points.

All the rhubarb of commerce is brought from the Chinese town Sini, or Selim, by the Bucharians. It grows on the neighbouring chain of lofty mountains, which stretches to the lake Koko-Nor, between 35° and 40° north latitude. It is dug up by the poor peasants, cleaned from the earth, cut in pieces, strung with the bark on strings, and exposed to dry under cover in the shade for a whole year, before it is again cleaned and prepared for exportation.

There is a distinction made in commerce between the Russian and Chinese rhubarb, although they both come from the same country.

The Russian is dearer, and always good, as very great attention is paid, both in purchasing and transporting it, by order of the government. In Kiachta, on the Russian frontier, it is received from the Bucharians by a Russian apothecary, who examines it. The bad is immediately burnt, and the good is freed from its bark, woody parts, and every impurity, in the most careful manner. It is then sent to Moscow and to Petersburgh, where it is again examined.

It is commonly in round pieces, of a reddish or whitish yellow colour, feels gritty between the teeth, and is often perforated with so large a hole, that many pieces have the appearance of a mere rind.

The Chinese or East-Indian rhubarb is brought by sea from Canton. It is heavier, harder, and more compact, than the other; seldom perforated with holes, and either in long pieces, or with two flat sides, as if they had been compressed. Dr. Lewis thinks that this is less aromatic, but stronger, than the Turkey; and that it has required less care in drying from having been lifted when the root was less watery.

The general characters of good rhubarb are, its having a whitish or clear yellow colour, being dry, solid, and compact, moderately heavy; brittle; when recently broken appearing marked with yellow or reddish veins, mixed with white; being easy pulverizable; forming a powder of a fine bright yellow, having the peculiar, nauseous, aromatic smell of rhubarb, and a sub-acrid, bitterish, somewhat astringent taste, and when chewed, feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous. The size and form of the pieces are of little consequence; only we must break the large ones, to see that they are not decayed or rotten within; and we must also observe, that they are not musty or worm-eaten. This is the more necessary, as damaged pieces are frequently so artfully dressed up, and coloured with powdered rhubarb, as to impose on the buyer.

The principal constituent of rhubarb is extractive matter, soluble

both in alcohol and in water. By gentle decoction, it loses above one half its weight. Rhubarb also contains some volatile odorous matter, on which its peculiar nauseous smell and its activity as a purge, depend; for when dissipated, either by age or any preparation to which the rhubarb has been subjected, the powers of the medicine are almost destroyed. It also contains about one-sixth of its weight of oxalat of lime, and some tannin, which resides entirely in the dark-coloured veins, for on wetting the surface with a weak chalybeate solution, these alone are blackened, while the white veins do not change their colour. Neumann got from 480 grains 180 of alcoholic, and afterwards 170 watery extract; and inversely, 350 watery, and only 5 of alcoholic extract.

Various species of rhubarb, especially the palmatum, are cultivated in England, and sometimes in very large quantities; so that there can be no doubt that the roots, the growth of that country, may be so prepared as to have the appearance, at least, of foreign rhubarb. The greatest difficulty seems to be the drying it properly. Its cultivation is easy. It is sown in spring, in a light soil, and transplanted next spring into a light soil, well trenched, and the plants set at a yard distance from each other each way. The third year, some plants begin to flower, but the roots are not lifted till the autumn of the sixth year. They are first to be washed in a large quantity of water, and after the fibres and small roots are cut off, to be well brushed in fresh water, and cut into pieces of a proper size. The brown bark is then rasped off, and they are again thrown into fresh water for three or four hours, in which they give out a great quantity of gummy matter. They are then taken out, and laid upon twigs to drip till next morning, and it is chiefly in this time, that they exude at every part a white transparent gummy matter, resembling jelly. They are lastly, placed in a stove, heated to 120° or 140°, till they dry. Twenty-five pounds of the recent root gave only about eight pounds dry. It is not, however, yet fit for sale. All the wrinkles must be rasped and filed out, and the pieces thus dressed put in a barrel fixed on an axis, and rolled about in it for twenty minutes or half an hour, when they get covered by a fine powder, formed by their rubbing against each other. Prepared in this way, Beaumé assures us that it not only has the appearance of foreign rhubarb, but like it, could also be immediately powdered. The chief peculiarity in this process is the steeping the roots, after they are cleaned, in water, by which means they are deprived of a great quantity of gummy matter; and without this precaution, even when apparently perfectly dry, the roots cannot be reduced into powder, but become pasty under the pestle, until it becomes two years old, and even then the powder is apt to concrete into lumps, and to get a dark-brown colour. Four ounces of French rhubarb yielded to Beaumé 1644 grains of extract, and the same quantity of foreign rhubarb 1500. British rhubarb, as it is called, is cultivated in considerable quantities in the neighbourhood of Edinburgh, and sold at nearly the price of foreign rhubarb. It is easily reduced to a very fine powder, although it is merely washed and peeled before it be cut into proper pieces, and

dried upon the top of a baker's oven. The leaf-stalks of rhubarb contain a pleasant acid juice, and are used for making tarts, which are very like those of quinces; and Olivier tells us, that the Persians have long been in the habit of using the rheum ribes in the same manner, preserved or raw.

Attempts have been successfully made, to introduce the culture of this valuable drug into Britain, and it appears from authentic accounts, that sufficient quantities of it may be reared, and that the English root has proved to be fully equal to the best sort obtained from Turkey or China.

The cultivation of rhubarb in the United States, is to be considered as an object of high importance. That our climate is perfectly congenial to its growth, has been clearly ascertained by successful experiments, which ought to encourage other attempts, and more extensive plans. The palmated, or officinal rhubarb, may be raised from seed sown either in the spring or autumn. When the plants appear, they require to be kept clear from weeds, and during the winter their roots should be covered with litter. The ensuing season, they may be transplanted, or thinned, to the distance of four or five feet. The soil must be a light fine mould, deeply ploughed, and the plants should be frequently watered, though too much wet will injure the roots. The young plants require to be sheltered from the sun till they have obtained a good degree of strength. The seed stalks ought to be cut off on the withering of the radical leaves, and their roots covered.

The roots of rhubarb must not be taken up, until six or seven years old, and it is supposed by some, that they increase in medicinal properties if suffered to remain in the earth for seven, eight, ten, or even twelve years. Much care is requisite in curing and preserving the roots for use. They lose about four-fifths of their weight in drying, which process is accomplished in six months.

The roots may be taken up early in the spring, or in autumn, when the leaves are decayed. They are to be washed clean, and the small fibres and external rind being pared, or cut off, they should be divided into pieces about one ounce in weight. A hole should be perforated in the middle, and the roots suspended on pack-thread, in a common kitchen, to dry; care being taken that none of the pieces come in contact with each other, so as to occasion mouldiness. The foot stalks of the leaves of the young plants, impart an agreeable acidity, similar to that of gooseberries, and are frequently used in pies and tarts.

Medical use.—Rhubarb is a mild cathartic, which operates without violence or irritation, and may be given with safety even to pregnant women, and to children. In some people, however, it occasions severe griping. Besides its purgative quality, it is celebrated as an astringent, by which it strengthens the tone of the stomach and intestines, and proves useful in diarrhœa, and disorders proceeding from laxity.

Rhubarb is exhibited,

1. In substance, in the form of powder. It operates more power-

fully as a purgative, in this form than in any other. The dose for an adult is about a scruple or upwards. On account of its great bulk, it is sometimes unpleasant to take, and its laxative effects are often increased by the addition of neutral salts, or other more active purgatives. In smaller doses, it often proves an excellent stomachic.

2, In infusion. Rhubarb yields more of its purgative property to water than to alcohol, The infusion is, however, considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared.

3. In tincture. On account of the stimulating nature of the menstruum, this preparation frequently cannot be exhibited in doses large enough to operate as a purgative. Its principal use is as a tonic and stomachic.

4. In pills. The virtues of rhubarb are destroyed by roasting, boiling, and in forming the extract.

The importance of cultivating this article amongst us, and the facility with which it may be effected, will be apparent, from the following abridged view of Dr. Fordyce's treatise on the subject, printed in 1792, and entitled, "The great importance and proper method of cultivating and curing Rhubarb in Britain."

Rhubarb was long known as a valuable article of commerce between Russia, Turkey, Persia, China, and England; but its locality was first discovered by Mr. Bell, of Antermony, in Scotland, who travelled from Petersburgh in the suite of Mr. Ismayloff, ambassador to Persia, in 1719, &c. He says, "Above the Sedenypalaty, near some ancient tombs of the Tartars, towards the source of the Irtish, on the hills and valleys, grows the best rhubarb in the world, without the least culture." He saw it again in great abundance among the Mongal Tartars, on the banks of the Kara, which runs into lake Baykall. Here he dug up as much as he wanted with a stick, on a hill where there are a great number of marmots, which burrow under the shade of their broad spreading leaves, probably contributing to its increase by their manure and by loosening the earth.

The Mongals never accounted it worth cultivating. Its mode of preparation and preservation, he thus describes. "After digging and gathering the rhubarb, the Mongals cut the large roots into small pieces, in order to make them dry more readily. In the middle of every piece they scoop a hole, through which a cord is drawn, in order to suspend them in any convenient place. They hang them for the most part about their tents, and sometimes on the horns of their sheep. This is a most pernicious custom, as it destroys some of the best part of the root, for all about the hole is rotten and useless. Whereas, were people rightly informed how to dig and dry this plant, there would not be one pound of refuse in one hundred."

The root in question is known among dealers by the name of Turkey rhubarb, because it was originally imported from the Levant. But since the extension of the East India trade, it has been

brought from China; and on the commercial improvements made in the Russian dominions, it has come also through that channel.

It is inferred, that the soil of the country where the rhubarb was discovered to prosper so remarkably, must be rich, since the grass it produces is so rank, (Bell); and, at the same time, that it must be a light loam, since Mr. B. was able to dig up the good part of the roots with the aid of a stick only—and since the Marmots found means to loosen the earth around them, which would have scarcely been possible had the soil been clayey and strong: and hence, that we must infer, that the most proper ground for the production of rhubarb, requires to be light and rich at the same time.

The late Sir Alexander Dick, President of the Edinburgh College of Physicians, was anxious to try whether its culture might not be effectually introduced into Britain: he applied, therefore, to a medical friend, the late Dr. Mounsey, at the court of St. Petersburgh, then high in favor with Peter, so as to procure an order for some of the best rhubarb seeds to be sent to the royal garden at St. Petersburgh. It there prospered greatly, often producing seed within two or three years, and growing so fast as to gain, not seldom, in less than three weeks, the height of twelve or fourteen feet. It is a very hardy plant, and when thriving, shoots up in stems of great size and beauty.

Dr. M. after the Czar's death, brought home some of the seeds, and gave a part to Sir A. Dick, who raised the plant at Prestonfield, and dried the roots—distributing the seeds to the Duke of Athol, Dr. Hope, and others. About seven years after, it was plentiful in the botanic garden of Edinburgh, &c.; and from the Baronet, Dr. Fordyce brought both seeds and roots to England. Not less than 200,000*l.* sterling is paid annually for rhubarb imported into Britain. It was cultivated with great care by Dr. F. in his garden at Putney-heath; and it was found, by a certificate from the druggists of London, of superior goodness. It is not an inferior sort, as some interested importers affirm.

Information as to its propagation and the curing of the roots.

Dr. Fordyce raised more than three hundred plants in one season. The seed was sowed in a hot-bed, and when three or four seed leaves appeared, he planted out in east and south-east exposure, where the ground was unmanured, or not too rich, as least apt to breed the fly, to which it is more subject than the turnip. Many fail. They answer best when sown as above, during the last half of March, or in April, or even to the end of May, and later, if the spring is cold and dry: they may be transplanted during the whole summer. Sets, likewise, from the more abundant stems, will often succeed well; and even the tap root under some circumstances.

As to the time of taking up the roots, that may be safely done when it shows its first growth, or as soon as it has seeded, or when the seed is ripened, or at any period in the last quarter of the year, or in the first of the ensuing. Though it may be taken up, dried, and used at the end of four years, it will not, how properly soever

managed, possess that solidity which is necessary for its excellence. It will be found in its most perfect state at the end of seven years; and after that age, if it has been carefully cultivated and skilfully cured.

Curing the root.—As soon as a root, weighing from three or four to seventy pounds, is dug up, let it be washed till it is thoroughly clean. Let the fibrous roots be taken away, and not the smallest particle of bark left on the large ones. Let these be cut into square pieces, as nearly as they will admit, of four inches in breadth, and one and a half deep; let a hole be made in the middle of each, about half an inch square: then let them be strung upon pack-thread, with a knot on each end, and at such a distance from one another, as to keep them from rubbing or entangling. Thus secured, let them be hung up in the form of a festoon, without delay, in the warm air of a kitchen or laundry, till the superfluous moisture is exhaled, in order to prevent their becoming mouldy or any way musty. They may be afterwards sufficiently dried at more leisure; then wrapt separately in cotton, and put into a bottle with a wide mouth.

In the Universal Magazine, vol. xi. p. 284, 1809, mention is made of two hundred pounds weight of the rheum palmatum having been dug up in the garden of Mr. S. Davies, in Swansea, from seeds sown in 1798. The roots weighed from thirty to thirty-five pounds each.

For further information on the subject of cultivating rhubarb, the reader is referred to Dossie's essay, in the second volume, article 14, of the Memoirs of Agriculture; and to Martyn's edition of Miller's Gardeners' Dictionary.

It is a curious fact, that the powder of rhubarb arising from the root, eaten by the worm, which so commonly attacks it, is, after passing through the intestines of the insect, equally active as a purgative, as from the perfect root.

Rhododendron Chrysanthum. *E.*

Yellow-flowered Rhododendron. The Leaves.

This small shrub grows in the coldest situations, and highest parts of the snow-covered mountains in East Siberia, and especially in Dauria. The leaves are oblong, rigid, reflected at the edges, rough on the upper surface, smooth, and paler on the lower. When dried, they have no smell, but a rough, astringent, and bitterish taste. They also contain a stimulant, narcotic principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions; and in a large dose, inebriation and delirium.

Medical use.—The Siberians use a decoction of it in rheumatism and gout. They put about two drachms of the dried shrub in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and this they take in the morning. Besides its other effects, it is said to produce a sensation of prickling or creeping in the pained parts; but in a few hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as this is apt to induce vomiting.

RHODODENDRON MAXIMUM. *Pennsylvania Mountain Laurel.*

This plant which is poisonous, is a species of the same genus as the Rhododendron, which has lately acquired much reputation in the cure of chronic rheumatism. The powder around the foot-stalks is errhine.*

RHUS TOXICODENDRON. *E. L.*

TOXICODENDRON. *A.* (*Secondary.*) *Poison Oak. The Leaves.*

This is a deciduous shrub of moderate growth, a native of North America. The leaves are alternate and stand upon very long leaf-stalks. Each leaf consists of three leafits. It is said that its juice is so extremely acrid as to cause inflammation, and sometimes even sphacelation, in the parts touched with it.

Medical use.—It was first tried as a medicine by Dr. Alderson of Hull, in imitation of the experiments of M. Fresnoi with the rhus radicans. He gave it in four cases of paralysis, in doses of half a grain, or a grain, three times a day, and all his patients recovered to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytic limbs. It has been given in larger doses, without experiencing the same success. It was not, however, inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

This family of plants deserves more attention than has yet been paid them. The excellent Inaugural Dissertation of Dr. Horsefield, on the Rhus Vernix, Rhus Radicans, and Rhus Glabrum, published in 1798, will amply repay the trouble of perusing it. See also Dr. Barton's Collections, Part I. and II.

RHUS GLABRUM. *A.* (*Secondary.*)

Sumach. The Berries.

* Barton's Collections, Part I. p. 18.

RICINUS COMMUNIS. *A. E. L. D.*

Monoecia Monadelphia.—Nat. ord. *Triccocæ.*

Palma Christi. The Seeds, and the Fixed Oil obtained from them. Castor Oil.

This plant grows in both Indies, Africa, and the south of Europe. It also grows luxuriantly in the southern states of America, where it is now becoming an article of export. It is of speedy growth, and in one year arrives at its full height, which seldom exceeds twenty feet. The capsules are prickly and triangular, and contain, under a thin, dry, grey, and black-marbled husk, a white oily kernel. The skin is extremely acrid; and one or two of the seeds swallowed entire, operate as a drastic purgative or emetic.

The kernels yield almost a fourth part of their weight of a bland fixed oil, commonly called castor oil. It is obtained from them either by expression or decoction in water. The former method is practised in Europe, the latter in Jamaica. To increase the product, it is common to parch the seeds over the fire, before the oil is extracted from them; but the oil thus obtained is inferior to that prepared by cold expression or simple decoction, and is apt to become rancid.

Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell.

Medical use.—As a medicine, it is a gentle and useful purgative; it in general produces its effects without griping, and may be given with safety where acrid purgatives are improper, as in colic, calculus, gonorrhœa, &c.: some likewise use it as a purgative in worm cases. Half an ounce or an ounce commonly answers with an adult, and a drachm or two with an infant.

With many the aversion to oil is so great, that this purgative cannot be taken without great reluctance; and accordingly different modes of taking it have been proposed. Some prefer taking it swimming on a glass of water, of milk or peppermint water, or in the form of emulsion, with mucilage, or with the addition of a little rum.

ROSA.

Icosandria Polygynia.—Nat. ord. *Senticosæ.*

Rosa Gallica. *E. L. D. Red Rose. The Petals.*

This has not the fragrance of the succeeding species; but the beautiful colour of its petals, and their pleasant astringency, have rendered them officinal. It must, however, be remarked that their odour is increased by drying, while that of the damask and moss roses is almost destroyed.

ROSA CENTIFOLIA. *A. E. L. D.*

Rose. Damask Rose. The Petals.

The native country of this shrub is unknown, but the delightful fragrance of its flowers has rendered it the favourite ornament of every garden. In the former editions of Linnæus, the damask rose was considered as a variety only of the rosa centifolia; but Aiton, Du Roy, aud Willdenow have arranged it as a distinct species. It is however highly probable, that the petals of all the varieties of the rosa centifolia, or Dutch hundred leaved rose, are employed indiscriminately with those of the real damask rose in the distillation of rose water.

ROSA CANINA. *E. L.*

Common Dog Rose. Wild Briar, or Hep-tree. The Fruit called Heps.

This shrub is found in hedges throughout Britain. The pulp of the fruit, besides saccharine matter, contains citric acid, which gives it an acid taste. The seeds, and stiff hair with which they are surrounded, must be carefully removed from the pulp before it can be used.

ROSMARINUS OFFICINALIS. *A. E. L. D.*

Rosemary. The Tops. The Herb and Flowers.

Rosemary is a perennial shrub, which grows wild in the south of Europe, and is cultivated in our gardens. It has a fragrant smell, and a warm pungent bitterish taste, approaching to those of lavender: the leaves and tender tops are strongest; next to these the cup of the flower; the flowers themselves are considerably the weakest, but the most pleasant.

Medical use.—Its virtues depend entirely on its essential oil, which seems to be combined with camphor, not only from its peculiar taste, but from its possessing chemical properties, which depend on the presence of camphor; and from its depositing crystals of camphor when long kept.

RUBIA TINCTORUM. *A. (Secondary.) E. L. D.*

Madder. The Root.

Madder is perennial, and grows wild in some parts of Britain, but the dyers are principally supplied with it from Zealand, where it is cultivated in large quantities.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout, have a weak smell, and a bitterish astringent taste. For the use of dyers, they are first peeled and dried, then bruised and packed in barrels. Madder possesses the remarkable property of tinging the urine, milk and bones, of animals which are fed with it, of a red colour.

Medical use.—It is said to be useful in the atrophy of children, and some believe in its reputed powers as an emmenagogue.

It is given in substance in doses of half a drachm, several times a day, or in decoction.

RUBUS TRIVIALIS. *A.* (*Secondary.*)

Dewberry. The bark of the Root.

RUBUS VILLOSUS. *A.* (*Secondary.*)

Black-berry. The bark of the Root.

The bark of the root of both these species of rubus, is astringent, and has latterly been much employed in the declining stages of dysentery, and in cholera infantum. It is more a domestic remedy, than one of regular practice; yet it is very highly commended by some of our first Physicians.

RUMEX.

Rumex Aquaticus. *D. Great Water Dock. The Root.*

This is a perennial weed, growing in ditches and by the sides of rivers. It grows to the height of five feet, and flowers in July and August. The root is large, and is manifestly astringent. It evidently is the *Herba Britannica* of the ancients, so much celebrated for the cure of scurvy and cutaneous diseases. Even syphilis, probably some syphiloid affection, has been said to yield to an infusion of water-dock in wine and vinegar.

Rumex Acetosa. *E. L. Common Sorrel. The Leaves.*

Sorrel is a perennial plant, which grows wild in fields and meadows throughout Britain, and flowers in June. The leaves have a pleasant acid taste, without any smell or particular flavour; their medical effects are, to cool, quench thirst, and promote the urinary

discharge: a decoction of them in whey affords an useful and agreeable drink in febrile or inflammatory disorders. All these effects are to be ascribed entirely to the super-oxalat of potass which they contain.

Rumex Acutus. *Narrow Dock.* } *The Roots.*
Rumex Crispus. *Curled Dock.* }

These grow about barn yards and in cultivated fields, flowering in July. The roots of both species are somewhat cathartic. The seeds are said to have been given with advantage in dysentery. The fresh roots bruised and made into an ointment or decoction, cure the itch. Some instances have occurred among the country people, of ill conditioned ulcers, and hard tumours apparently of a cancerous nature, having been entirely removed by the application of the bruised roots of dock or a decoction of the same.

RUMEX BRITANNICA. *A.* (*Secondary.*)

Water Dock. The Root.

RUMEX OBTUSIFOLIUS. *A.* (*Secondary.*)

Blunt-leaved Dock. The Root.

These two species are introduced into the secondary list of the Materia Medica of the American Pharmacopœia, but we have no particular knowledge of their powers or virtues.

RUTA GRAVEOLENS. *E. L. D: Rue. The Herb.*

This is a small shrubby plant, a native of the south of Europe, and cultivated in our gardens.

Rue has a strong ungrateful smell, and a bitterish penetrating taste: the leaves, when in full vigour, are extremely acrid, insomuch as to inflame and blister the skin, if much handled. Neumann got from 960 grains of the dried leaves 330 alcoholic extract, and afterwards 290 watery; and inversely, 540 watery and 40 alcoholic. Both primary extracts are bitter and acrid. Rue also contains a volatile oil, which congeals readily, and is obtained in greatest quantity by distilling the plant with the seeds half ripe.

Medical use.—With regard to their medical virtues, like other remedies, of which the active constituent is an essential oil, they are heating and stimulating, and hence sometimes are serviceable in spasmodic affections, and cases of obstructed secretions.

S.

SACCHARUM. *A. L.* *SUGAR.*

SACCHARUM OFFICINARUM. *E. L. D.*

a. SACCHARUM NON PURIFICATUM. *E.* SACCHARUM RUBRUM. *D.* *Raw, or Brown Sugar.*

b. SACCHARUM PURIFICATUM. *L. D.* SACCHARUM PURISSIMUM. *E.* *Double Refined Sugar.*

c. SACCHARI RUBRI SYRUPUS. *D.* SYRUPUS EMPYREUMATICUS. *E.* *Melasses.*

The sugar cane grows wild in both Indies, and forms the principal object of cultivation in the West Indies.

Sugar is a hard, but brittle substance, of a white colour, disposed to form semi-transparent crystallizations, of a sweet taste, and without smell. When heated sufficiently, it melts, is decomposed, emits a peculiar smell (caromel,) and becomes inflamed. Sugar at 40° is soluble in its own weight of water, and in still less at 212°. It is also soluble in about four parts of boiling alcohol. It combines with volatile oils, and renders them miscible with water. It also unites with potass and lime. It is decomposed by the concentrated sulphuric and nitric acids. According to Lavoisier's experiments, it consists of 71.76 oxygen, 17.89 carbon, and 10.35 hydrogen; or, according to the original calculation, of 64 oxygen, 28 charcoal, and 8 hydrogen.

Sugar is principally obtained from the plant, by boiling down its expressed juice, with the addition of a certain proportion of lime or potass, until the greater part is disposed to concrete into brownish or yellowish crystalline grains. The lime or potass is added to saturate some malic acid, whose presence impedes the crystallization. The *melasses*, or that portion of the inspissated juice which does not crystallize, is separated from the *raw sugar*, which is sent to Europe to be refined. This is performed by dissolving it in water, boiling the solution with lime water, clarifying it with blood or white of eggs, and straining it through woollen bags. The solution, after due evaporation, is permitted to cool to a certain degeee, and then poured into conical forms of unglazed earthen ware, where it concretes into a mass of irregular crystals. The syrup which has not crystallized, is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moist clay, the water of which gradually penetrates into the sugar, and displaces a quantity of syrup, which would otherwise be retained in it, and discolour it. It is then carefully dried, and gets the name of *loaf* or *lump sugar*. When the solution and other steps of the pro-

cess are repeated, the sugar is said to be *double refined*. Sugar is sometimes made to assume a more regular form of crystallization, by carrying the evaporation only a certain length, and then permitting the syrup to cool slowly. In this form it is called *Brown or White sugar candy*, according to the degree of its purity.

Raw sugar varies very much in quality. It should be dry, crystallized in large sparkling grains, of a whitish or clear yellow colour, without smell, and of a sweet taste, without any peculiar flavour.

Refined sugar should have a brilliant white colour, and a close compact *texture*. It should be very hard, but brittle, and break with sharp, semi-transparent, splintery fragments.

Medical use.—Sugar, from being a luxury, has now become one of the necessaries of life. In Europe, sugar is almost solely used as a condiment. But it is also a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West-Indies, notwithstanding their increased labours, always grow fat. It is in this way also, that its internal employment is useful in some diseases, as in sea-scurvy; for sugar produces no particular effect as a medicine, except that the coarser and impure kinds are slightly purgative. Applied externally, it acts as an escharotic in spongy and unhealthy granulations; and to abraded or inflamed surfaces, it proves gently stimulant. In pharmacy it is principally employed to cover bad tastes, to give form, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote instead of retard, the fermentation of the articles it is intended to preserve.

Melasses or treacle, is a very impure syrup. It is thick, viscid, of a dark brown, almost black colour, and has a peculiar smell; and a sweet, somewhat empyreumatic taste. Treacle is applied to many domestic and economical purposes; and in hospital practice may supersede the use of sugar, in many instances.

SAGAPENUM. *E. L. D.*

Sagapenum. A Gum-resin of a non-descript plant.

The plant which furnishes this substance is not ascertained, but is conjectured by Willdenow, to be the Ferula Persica.

Sagapenum is a concrete juice brought from Alexandria, either in distinct tears, or agglutinated in large masses. It is outwardly of a yellowish colour; internally, somewhat paler, and clear like horn; it grows soft upon being handled, and sticks to the fingers; its taste is hot, nauseous, and bitterish, and its smell disagreeable and alliaceous.

Neumann got from 480 grains, 306 alcoholic, and 108 watery, extract; and inversely 170 watery, and 241 alcoholic, extract. The al-

cohol distilled from it was sensibly impregnated with its flavour, and along with the water, a considerable portion of volatile oil arose. It is not fusible.

Medical use.—In medical virtues, it holds a kind of middle place between assafœtida and galbanum, and may be employed in the same manner, and under similar circumstances.

SAGO. *A. Sago. The pith of the Cycas Circinalis.*

A light, nutritious aliment for convalescents, more appropriately located amongst the materia alimentaria.

SALIX.

Salix Fragilis. *D. Crack Willow. The Bark.*

Salix Alba. *D. Common White Willow. The Bark.*

Salix Caprea. *L. E. Great round-leaved Sallow. The Bark.*

Salix Eryocephala. *A. Willow. The Bark.*

The barks of these, and other species of willow, have been recommended as substitutes for cinchona. The white willow was first introduced into practice by Mr. Stone; and strong evidence in favour of the use of the broad-leaved, in debility, intermittents, and foul ulcers, has been published by Messrs. James, White, and Wilkinson; and Dr. Cullen, on this authority, and from the sensible qualities it possesses, recommends it, in his *Materia Medica*, as a substitute for the cinchona. Mr. Stone gathered the bark in summer, when it was full of sap; dried it by a gentle heat, and gave a drachm of it powdered every four hours, betwixt the fits. In a few obstinate cases, he mixed it with one-fifth part of the cinchona. Some judicious physicians here, says Dr. Cutler, made trial of the bark of white willow, and recommend it as a valuable substitute for the Peruvian bark. They have used principally the bark of the root. These barks possess very considerable astringency and bitterness, but differ chemically from cinchona in containing no tannin. An ounce and a half of the dried bark should be first macerated six hours in two pounds of water, and then made to boil in it, for ten or fifteen minutes. An ounce or two of this decoction may be given three or four times a day, or oftener.

Salix Latifolia. *Broad-leaved Willow. The Bark.*

This possesses greater medicinal properties than any of the other species of salix; and is now substituted by many British physicians for the Peruvian bark. Three British pamphlets upon this subject have been published within a few years; the last, by Dr. Wilkinson, (1803) is replete with encomiums on the remedy in question. This species of salix may be distinguished by the shape of its leaves from all others, except the salix pentandria, or bay-leaved willow. But the leaves of the latter are smooth and shining, and of a deeper green; nor have they the downy appearance on the under surface, which is so remarkable in the *salix caprea* or *latifolia.* It is found in woods and hedges on hilly situations, and delights in cold, clayey, moist ground. The most proper time to gather the bark, is in May or June; it should be cut in small pieces, and dried in the shade. This bark is very astringent to the taste, and somewhat bitter, but it loses the latter quality when dry. Dr. Wilkinson directs one ounce and a half of the coarse powder of the bark to be infused in one quart of water for six hours; then to boil it over a gentle fire for a quarter of an hour, and strain for use: of this, the ordinary dose is two or three large spoonsful, three or four times a day; but in the ague and fever, one or two ounces may be given every third hour, in the interval of the fit. The strong decoction of this bark resembles port wine in colour, for which, by several who have seen it in vials, it has been mistaken.

Dr. Wilkinson relates sixteen cases of disease, in which this bark was employed with decided advantage, and from which he does not hesitate to assign to it, virtues greatly superior to those of the cinchona: in particular, he relates a case of extreme emaciation from an ulcerated foot, which was perfectly cured, after having resisted the continued use of Peruvian bark, and the exertion of the physicians of two public charities. It is, doubtless, a remedy of considerable efficacy, and is strongly recommended on account of its cheapness, and the facility of procuring it. It appears to be useful in most cases where the cinchona is usually resorted to.

SALVIA OFFICINALIS. *E. D. Sage. The Leaves.*

Sage is a perennial plant, a native of the south of Europe, and cultivated in our gardens. There are several varieties of it, differing in size, or in the colour of its flower, but their properties are the same. They have a peculiar aromatic smell, and a warm aromatic taste, with some degree of bitterness and astringency.

Medical use.—In its effects, sage agrees with other aromatics. It is stimulant, carminative, and tonic. In cold phlegmatic habits, it excites appetite, and proves serviceable in debilities of the nervous

system. The best preparation for these purposes is an infusion of the dry leaves, drunk as tea; or a tincture, or extract, made with rectified spirit, taken in proper doses; these contain the whole virtues of the sage; the distilled water and essential oil only its warmth and aromatic quality, without any of its roughness or bitterness. Aqueous infusions of the leaves, with the addition of a little lemon-juice, prove an useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

The above plant is an evidence, either of the fickleness of physicians, or of the undue praises, which plants of the most trifling virtues can elicit from practitioners. When the ancient poets, speaking of this plant, exclaimed

"Cur moriatur homo cui salvia crescit in horto;"

who could have imagined the time would ever arrive, when its sole employment would be that of a simple drink in fevers, &c. Such are the mutations which alike await hundreds of those articles, which now stand proudly pre-eminent in the catalogues of the Materia Medica. It may serve as a beacon to check the strong propensity which exists, to enlarge the already crowded lists, with any article that is supposed to possess the smallest medicinal powers. Yet, inert as the present article may be, I am persuaded it better deserves a place than many now to be found in the lists.

SAMBUCUS NIGRA. *E. L. D.*

Common Elder. The Flowers, Berries, and inner Bark.

This tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a sweetish, not unpleasant, taste; nevertheless, eaten in substance, they offend the stomach. For the market, they are gathered indiscrimately from the Sambucus nigra and ebulus, a very venial fraud, as their effects are exactly the same. They are, however, easily distinguished, by the latter, when bruised, staining the fingers of a red colour, and the former of the colour of a withered leaf.

Medical use.—The expressed juice, inspissated to the consistence of a rob, proves an useful aperient medicine; it opens obstructions of the viscera, promotes the natural evacuations, and, if continued for a length of time, does considerable service in various chronical disorders. The inner green bark of its trunk is gently cathartic. An infusion of it in wine, or the expressed juice, in the dose of half an ounce or an ounce, is said to purge moderately, and in small doses to prove an efficacious deobstruent, capable of promoting all the fluid secretions. The young leaf-buds are strongly purgative, and act with so much violence, as to be deservedly accounted unsafe. The flowers are very different in quality: these have an agreeable aromatic flavour, which they yield in distillation with water, and impart by infusion to vinous and spirituous liquors.

SAMBUCUS CANADENSIS. *A.* *Elder.* *The Berries.*

Although the framers of the American Pharmacopœia appear to have thought so highly of this article, as to have introduced it into *both* their lists, it is probable that its virtues are not superior in any particular to those ascribed to the preceding.

SANGUINARIA. *A.* Sanguinaria Canadensis.

Blood Root. *Puccoon.* *The Seeds and Root.*

This is a common plant in the United States, and is called also red root, Indian paint; turmeric. The leaves are roundish, and deeply indented; stems naked, supporting single flowers; blossoms white. It grows in rich woodland, and flowers in April. When the fresh root is broken, a juice issues in large drops resembling blood. The Indians used it for painting themselves, and highly esteemed it for its medicinal virtues. It is emetic and cathartic, but must be given with caution. An infusion of the root in rum or brandy, makes a good bitter. If it be planted in rich shady borders, it flourishes well in gardens: and the large leaves and blossoms make an agreeable appearance soon after the frost is out of the ground.

[*Cutler's Account of Indigenous Vegetables.*

From an Inaugural Dissertation on *Sanguinaria*, by Dr. Downy (Philadelphia, 1803), the following useful information is obtained. " The root is from one-fourth to half an inch in diameter, from three to four inches long, sending forth numerous stringy fibres, two or three inches long: a coloured liquor is thrown out when the root is broken. The stalk is six or eight inches long, and of the thickness of a quill. The leaves are cordate and lobate.

" There is but one leaf to a stalk; on each lobe, one large fibre, of a light yellow colour, may be seen running from the stalk, and many smaller ones branching from it in all directions. The powdered root, in doses of fifteen or twenty grains, is powerfully emetic. Eight grains is a mild dose, and is but little inferior to ipecacuan. It contains a large proportion of gum, some resin, and extractive matter. The first and last are the most active parts.

" The leaves and seeds of the plant are powerful and diffusible stimuli; promote sweat, and are given in Maryland with that view to horses, to promote the shedding of their coats. A tincture of the root is used to prevent the intermittent fever; and a decoction of the roots to cure the dysentery. In one case, it operated powerfully upon the uterus, and produced abortion; hence it might be useful in female obstructions."

The seeds are said, by Professor Barton, (collection for Materia Medica) to possess nearly the same quality of those of stramonium, viz. they induce fever, delirium, dilated pupil, &c. A deleterious

property resides also in the leaves. The root has been used in gonorrhœa, for the bites of serpents, and in bilious diseases; and the juice is employed to destroy warts. In some parts of New England, a spirituous tincture of the root is used as a tonic bitter. It is expectorant, and is apparently allied in properties to rattle-snake root.

The medical properties of *sanguinaria* have been investigated by numerous trials in the hands of Doctor Aaron Dexter. The experimental tests of this gentleman, corroborated by those of other respectable physicians, afford the most satisfactory evidence, that it possesses very active powers, and that in doses of one grain of the powdered root, or ten drops of a saturated tincture, it proves efficacious as a stimulant and diaphoretic. But in large doses, it excites nausea and vomiting, and if incautiously administered, it is of dangerous tendency.

It is said to be efficacious in removing jaundice, and is believed to be a chief ingredient in the quack medicine known by the name of Rawson's Bitters.

Dr. Israel Allen, of Sterling, and others, have had recourse to this medicine as a substitute for digitalis, in coughs and pneumonic complaints; and on some occasions it is said to have proved equally efficacious, and less debilitating than foxglove, when exhibited with the same precautions.

The dose of the saturated tincture of the root is from thirty to eighty drops twice in the day, increasing or decreasing the number as particular circumstances may require.

SAPO. *A. E. L. D.* *Castile Soap.*

SAPO DURUS. *Hard Soap, composed of Soda and Olive Oil.*

SAPO MOLLIS. *Soft Soap, made of Potass and Oil.*

Soaps are combinations of the fluid or concrete fixed oils with alkalies, earths, or metallic oxyds. The alkaline soaps have an unpleasant taste and peculiar smell, form a milky solution with water, and a transparent one with alcohol, and are powerfully detergent. White soap is made of soda and olive oil or tallow. Brown soap contains also resin. Soft soap consists of potass and whale oil; the white spots in it are from the addition of a little tallow. The volatile liniment of the Pharmacopœias is a soap of ammonia and olive oil. The alkaline soaps are decomposed by all the earthy salts. The alkali of the soap combines with the acid of the salts, and an earthy soap is formed from the union of the earth and oil. The earthy soaps are insoluble in water. The alkaline soaps are decomposed in the same way by the metallic salts. The metallic soaps are also insoluble in water; many of them are soluble in oil, and some of them in alcohol.

Soap is of two kinds, hard and soft; hard when it is made with soda, and soft when made with potass. The latter is a strong, but coarse soap, and in medicine is only used externally as a detergent and cataplasm. The officinal species of the former is composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use we prefer the Spanish.

It should be white and hard, dissolve entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution: the solutions should froth freely on agitation. It should not be variegated in its colour, feel greasy or moist, or be covered with a saline efflorescence; and the solutions should not have a rancid smell or taste. Some of the foreign dispensatories are so very particular about the nature of the soap used in medicine, as to direct it to be prepared by the apothecary, by simply triturating, without the assistance of heat, Provence oil, with half its weight of a solution of soda, of the specific gravity of 1.375, until they unite.

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali, and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali; while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy or metalline soaps are formed.

Medical use.—The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to very erroneous notions of its medical virtues. It was supposed to render such substances more readily soluble in the juices of the stomach, and in the fluids of the body, and to be well fitted for dissolving such oily or unctuous matters as it may meet with in the body, attenuating viscid juices, opening obstructions of the viscera, and deterging all the vessels it passes through. It has likewise been supposed a powerful menstruum for the urinary calculus; and a solution of soap in lime-water, has been considered as one of the strongest dissolvents that can be taken with safety into the stomach; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime-water when unmixed.

How erroneous these ideas are, appear evidently, when we recollect the very easy decomposition of soap, which renders it perfectly impossible that it should enter the circulating system, or, indeed, come into contact with the fluids even of the mouth, without being decomposed. As to the solution of soap in lime-water, we may observe, that it is only a clumsy way of exhibiting a solution of soda; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should, therefore, be confined to the giving form to other substances which are not decomposed by it, and to decompose metallic poisons when they have been taken into the stomach. For this last purpose, a tea-cupful of a solution of soap, in four times

its weight of water, may be drunk every three or four minutes, until a sufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricating nature of the oil. In this way it often proves a powerful discutient, and a useful application to sprains and bruises.

SCILLA. *A.* *Squill.*

Scilla Maritima. *E. L. D.* *Squill.* *The Root.*

Hexandria Monogynia.—Nat. ord. *Liliaceæ.*

The squill is a perennial bulbous-rooted plant, which grows wild on the sandy shores of Spain, Portugal, north of Africa, and the Levant.

The root is about the size of the fist, pear-shaped, with the apex upwards, and consists of fleshy scales, attenuated at both edges, surrounded by other scales, which are arid, shining, and so thin that the root at first sight seems to be tunicated. The recent roots are full of a white viscid juice, have scarcely any smell, but a very bitter, nauseous, and extremely acrid taste. Rubbed on the skin, it inflames and blisters.

It is more commonly met with in the shops, in the form of the dried scales, which should be brittle, semi-pellucid, smooth, but marked with lines, and when chewed, should feel tenacious, and taste very bitter, without manifest acrimony.

The active constituent of the squill is the acrid principle; and, therefore, it becomes almost inert by too much drying, or by being kept too long in the form of powder. It also contains bitter extractive, much mucilage, albumen, and starch.

Medical use.—Given internally in large doses, it produces purging and vomiting, sometimes even strangury, bloody urine, inflammation and erosion of the stomach. In smaller doses it proves an useful expectorant and diuretic, and it is said to lessen the frequency of the pulse.

Squill is sometimes given as a general stimulant in typhus, especially to cattle. But it is much more frequently exhibited as an expectorant where the lungs are loaded with viscid matter, and as a diuretic in dropsical cases, for which purpose it is commonly conjoined with calomel.

The dose of dried squill is one or two grains three or four times a day; and the most commodious form for the taking of squills, unless when designed as an emetic, is that of a bolus, or pill: liquid forms are to most people too offensive, though these may be rendered less disagreeable both to the palate and stomach by the addition of aromatic distilled waters.

PULVIS SCILLÆ. *D.* *Powder of Squill.*

Cut the squills, after having removed their membranous integuments, into transverse slices; dry these on a sieve with a gentle heat, and reduce them to powder, which is to be kept in phials with ground glass stoppers.

By this method the squill dries much sooner than when its several coats are only separated; the internal part being here laid bare, which, in each of the entire coats, is covered with a thin skin, which impedes the exhalation of the moisture. The root loses in this process four-fifths of its original weight; the parts which exhale with a moderate heat appear to be merely watery; hence six grains of the dry root are equivalent to half a drachm of it when fresh; a circumstance to be particularly regarded in the exhibition of this medicine. But if too great heat has been employed to dry it, it becomes almost inert, and it also loses by long keeping in the state of powder.

Dried squills furnish us with a medicine, sometimes advantageously employed as an emetic, often as an expectorant, but still more frequently as a powerful diuretic.

SCROPHULARIA NODOSA. *D.*

Knotty-rooted Figwort. The Herb.

This is a perennial plant, growing in woods, and under hedges. It flowers in July. The roots are grey and knotty, and have a nauseous smell, and a sweet but somewhat acrid taste, both of which they partly lose by drying.

SECALE CORNUTUM. *A.* (*Secondary.*)

Spurred or Horned Rye. Ergot. The Spur.

Although introduced by the American Pharmacopœia into the secondary list, if the observations of many practitioners are to be credited, this article better deserved a more exalted standing, than many which are placed in the primary list.

Rye is subject to a disease, particularly when a hot summer succeeds a rainy spring; the spurious substance thus produced is in France called ergot, from its resemblance to a cock's spur, but in

England it is termed *horned rye*, spur, or *hornseed*. In Cullen's Materia Medica it is termed secale cornutum. Bread made of this kind of rye has a nauseous acrid taste, and produces numerous fatal diseases, as spasm, extreme debility, and mortification of the extremities. At various periods subsequent to the year 1596, the most alarming and destructive consequences were occasioned among the poor in France and England, by the use of bread made of such damaged grain. Horned rye is said to have been equally fatal to brutes and fowls, when fed with it by way of experiment.

Rye is affected with the disease in this country similar to that in Europe, particularly summer rye, in low, wet situations. The singular production called ergot, is found projecting from among the leaves of the spike, or ear; it is a long crooked excrescence, resembling the spur of a cock, pointed at its extremities, of a dark brown colour externally, and white within. Some spikes are occupied wholly by spurs, whole others have two or three only, interspersed with genuine seeds of rye.

The medicinal properties of this extraordinary substance were first announced to the public by Dr. John Stearns, of Saratoga county, in a letter to Dr. Akerly, of New-York, in which the article is extolled for its powers, *ad partum accelerandum*. It is now satisfactorily ascertained, that ergot is capable of exerting a specific action on the uterus, and of augmenting the powers of this organ during the efforts of parturition. Hence, in lingering and laborious cases it is found to be an invaluable medicine, speedily inducing forcible pains, and greatly expediting delivery. For obvious reasons, however, it is proper to caution against employing this powerful parturient in cases of preternatural presentation. In the form of powder, it is given from five to ten or fifteen grains; but it has sometimes been found more active in the form of decoction, half a drachm of the powder being gently boiled in half a pint of water; one third may be given every twenty minutes, until proper pains shall have commenced. A large dose of decoction, or of pulvis *ad partum accelerandum*, will excite nausea and vomiting. No example of ergot having induced deleterious effects, has come to our knowledge; but there is much reason to suppose that it is capable of producing abortion at any stage of pregnancy.

A writer in the New England Medical Journal, No. I. Vol. I. asserts that it has not appeared to relax the rigidity of the muscular fibres, "but it has almost uniformly increased the efforts of the uterus to expel the fœtus." And also, that occasions have occurred, authorizing a caution of the highest importance in practice. The powerful and continued efforts of the uterus, from the effects of ergot, prevent the retreat of the child's head after being advanced, and the unceasing pressure has in some instances occasioned the death of the child. Let this circumstance, therefore, have its due effect, and induce the utmost precaution in the administration of this powerful article. In one case of amenorrhœa, Dr. Beckman administered one drachm of ergot in decoction; bearing down pains immediately ensued, and the suppression was the next day removed. It

has been successfully employed, on similar occasions, by other practitioners. However extraordinary it may appear, the assertion is from the most creditable source, that ergot has often proved one of the most efficacious remedies in menorrhagia in all its stages; and moreover, it restrains in a remarkable manner the *profusio uterina* following the separation of the placenta in parturition.

In two instances ergot is stated to have been administered in considerable quantities during the early stage of pregnancy. In one case, about four drachms were taken within a few days; the consequence was regular pressing down pains, resembling the severest throes of parturition; and these recurred with every repetition of the medicine, yet on examination, the os uteri was not much dilated. In neither case was the natural term of gestation interrupted by the operation of the medicine.

The fact has long been known among our farmers, that rye itself possesses a quality of inducing abortion in females of the animal tribe, and they carefully withhold that grain from such, during their periods of gestation.

To those who feel interested in the subject, the following references may prove acceptable. They form, it is probable, but a small proportion of what may be found in relation to it, having been cursorily noted down in general reading.

Tissot, Philosophical Transactions, vol. 55. p. 106.—Critical Review, 1766, p. 133.—*Foederè*, Med. Legale, 4. 46.—Eclectic Repertory, 4. 249. 7. 266, 429. 8. 129. 9. 260.—*Perrault*, Philosophical Transactions, 1676, 11. No. 130.—Do. Abridged (*Pearson*) 2. 357. 12. 208.—*Geoffroy*, Matierre Medicale, 10. p. 7.—*Zimmerman*, Experience, &c. 2. 168.—*Bondeli*, Letters to Dr. Lang.—*Lemery*, *Ritter*, *&c.* in L'Histoire de l'Acad. Roy. de Sciences, 1718.—*Ray*, Hist. Plant. 1. 1241, mentions it as then used to excite the Lochia.—*Hoffman's* Pract. 2. 300, 303, notices its noxious effects as known to Galen.

The following observations on the agency of the ergot in producing dry gangrene, are extracted from the inaugural essay of Dr. Charles C. Byrd, of Virginia, 1821.

"The dry gangrene, though rarely met with in this country, was known many years ago in France; to the periodical writings of which country, we are indebted for much information respecting the disease. The first communication on the subject, given to the world, was made by M. Dodard, in 1676, in a letter inserted in the Journal dés Savans, by whom it was stated, even at that early period, to arise from eating rye bread, tainted with the ergot; subsequently M. Saviard, surgeon to the Hotel Dieu of Orleans, where there were many patients with dry gangrene, remarks, that persons are attacked with it, who live on rye bread; he further states, that the extremities of those who have it, are as dry as touch-wood, and as emaciated as Egyptian mummies. This disease commences in the extremities or parts most remote from the source of the circulation; attended generally with but little fever, inflammation, or pain; the limb becomes dead, and is either separated by the absorbents, or requires to be removed by the knife. It has always been found to prevail most, in those seasons favourable to the production of the ergot, and to be confined to those who lived on rye: these circumstances, so strong of themselves, sufficed to convince all who witnessed them, that this species of gangrene had its origin in the use of rye containing the ergot, have since been corroborated by the experiments of

M. Tiessier, which proved that fowls fed for any length of time with the article, were attacked with a disease similar to the dry gangrene of human beings; still, however, the question is not settled, and doubts are held on the subject even at the present day. Led by an inclination to satisfy myself with regard to this interesting question, I instituted experiments during the last summer on ducks, which, though made on a small scale, afforded the most conclusive results. I shall give a history of them from the time of administering the first dose of ergot, until the death of the fowls.

"On the 28th of June, 1820, having procured two well grown healthy ducks, I commenced by mixing the ergot in small quantities in their food, but was unable to disguise it in such a way as to get them to eat it; finding this to be the case, I determined to force it upon one of them in such quantity as I thought sufficient for my object: I began therefore, on the 7th of July, and gave to one of them one drachm of the ergot per diem in the dose of twenty grains, morning, noon, and evening: with this course I soon perceived an evident change in the fowl; it became languid, lost its appetite, and there was a discharge of limpid fluid from the eyes, nose, and mouth; that from the nose soon became bloody and offensive, the beak became affected, it was dark and shrivelled, the feet and legs were black and glossy. On the 18th instant, this duck died, I rather believe from some accident, for, although labouring under the effects of the ergot, mortification had not proceeded far enough to produce death, alone. On dissection I found the stomach (or as it is commonly called, the gizzard) red as if inflamed, the muscles of the thigh were hard and dry.

"On the 19th of July, I commenced a precisely similar course with the remaining duck, but why the disease produced in this case, differed from the other, I am quite at a loss to decide. But the disease here produced, might, with much propriety, be called wet gangrene; the beak of this duck, instead of being dry like the former, was covered with a vesicle, the investing membrane of the bill being much elevated, and containing below it, a dark coloured fluid, the skin of the legs was covered with moisture, and in a few days more, worms and maggots were generated. The claws now began to fall out, the integuments covering the feet and legs sloughed away, and on the 1st of August, it died with its whole body in a state of putrefaction.

"From the results of the experiments above stated, I am led to the certain conclusion, that the ergot is capable of producing the dry gangrene; but, at the same time, I am convinced, and indeed the fact is mentioned by M. Bossau, that the gangrene is not always of the dry kind, which certainly is proved by my last experiment, the result of which was witnessed by several students, and also by Dr. S. Jackson, of this city."

SESAMUM ORIENTALE. *Sesami Oleum. A.* (*Secondary.*)

Benne Oil. The Fixed Oil of the Seeds.

This originally an African plant, has become well known by the name of *benne* in South Carolina and Georgia, or the Vangloe of the West Indies. It is an annual plant, rising with an herbaceous four-cornered stalk, two feet high, sending out a few short side branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers terminate the stalk in loose spikes; they are small, of a dirty white colour, shaped somewhat like those of foxglove. After the flowers are past, the germen turns to an oval, acute pointed capsula, with four cells filled with oval compressed seeds, which ripen in autumn. Of late years, the seeds have been introduced into the

states of Georgia and South Carolina, by the African negroes, where the plant succeeds extremely well; and they boil a handful of the seeds with their allowance of Indian corn, which forms a nourishing food. But the excellency of these seeds, consists in their yielding a larger proportion of oil than any other vegetable with which we are acquainted. One hundred weight of seed will produce ninety pounds of oil of an equal, and even preferable quality, to Florence oil. It will keep good many years without contracting any rancid smell or taste, and when the warm taste of the seed, discovered in the oil when first drawn, is worn off, it becomes quite mild, and is found to be a pleasant and agreeable substitute for all the purposes of salad oil. The benne oil in some parts of the southern states, is esteemed as a gentle laxative, in those cases where the more nauseous castor oil is usually employed. It also burns well in lamps. The leaves of this plant by infusion or decoction are found to afford an excellent mucilage, well adapted to all the intentions of that class of remedies, and in 1803, was used with the most marked good effect, in an epidemic dysentery in South Carolina. Considering, therefore, the great utility and importance of the benne plant, its cultivation by our planters cannot be too strongly recommended.

SILENE VIRGINICA. *Ground Pink.*

This species of silene or catch-fly, is abundant in many parts of the United States. Some of the Indians say it is a poisonous plant. In decoction, the root has been found a very efficacious anthelmintic.*

SERPENTARIA. *A.* ARISTOLOCHIA SERPENTARIA. *E. L. D.*

Virginia Snake-root. The Root.

Gynandria Hexandria.—Nat. ord. *Sarmentosæ.*

This is a small, light, bushy root, consisting of a number of strings or fibres matted together, issuing from one common head; of a brownish colour on the outside, and paler or yellowish within. It has an aromatic smell, like that of valerian, but more agreeable: and a warm, bitterish, pungent taste, very much resembling that of camphor. Treated with alcohol, it affords a bright green tincture, which is rendered turbid by water; by filtration a small portion of a green matter is separated, but its transparency is not restored. It neither precipitates tannin nor gelatin, nor affects the salts of iron or tinc-

* Barton's Collections, Part I. p. 39.

ture of turnsole. When the diluted tincture is distilled, the spirit and tincture pass over milky, strongly impregnated with its peculiar flavour.

Medical use.—Its virtues are principally owing to the essential oil with which it abounds. Its general action is heating and stimulant; its particular effects, to promote the discharge by the skin and urine. In its effects, it therefore coincides with camphor, but seems to be a more permanent stimulus.

It is recommended,

1. In intermittent fevers, especially when the paroxysms do not terminate by sweating; and to assist the action of Peruvian bark in obstinate cases.
2. In typhus, and in putrid diseases, to support the *vis vitæ,* and to excite gentle diaphoresis.
3. In exanthematous diseases, when the fever is of the typhoid type, to support the action of the skin, and keep out the eruption.
4. In gangrene. Externally it is used as a gargle in the putrid sore throat.

It is exhibited,

1. In powder, which is the best form, in doses of twenty or thirty grains.
2. In infusion with wine or water. By decoction its powers are entirely destroyed.

It is often combined with Peruvian bark, or with camphor.*

SINAPIS. *A. Mustard.*

SINAPIS NIGRA. *L.* SINAPIS ALBA. *E. D.*

Common Mustard. White Mustard. The Seeds.

These plants are both annual, both grow wild in England, and possess similar virtues.

They produce small round compressed seeds, which have an acrid bitterish taste, and a pungent smell when reduced to powder. The common mustard has blackish seeds, and is more pungent than the white.

They impart their taste and smell in perfection to aqueous liquors, whilst rectified spirit extracts extremely little of either: the whole of the pungency arises with water in distillation. Committed to the press, they yield a considerable quantity of a soft insipid oil, perfectly void of acrimony; the cake left after the expression, is more pungent than the mustard itself.

Medical use.—Mustard-seed is swallowed entire, to the quantity

* The late Dr. Barton says the root of the aristolochia sipho of L'Herritier, which grows in various parts of the United States, is, for certain purposes, perhaps preferable to the common snake root.

of a table spoonful or more, to stimulate the stomach in some cases of dyspepsia, and to excite the peristaltic motion of the intestines, especially when they are torpid, as in paralysis. The powder made into a paste with water, is commonly used as a condiment with animal food; infused in water, it proves emetic when taken in considerable doses, and in smaller ones, acts as a diuretic and aperient; but it is more frequently applied externally as a topical stimulus, made into a paste or sinapism with vinegar and bread-crumb. A weak infusion of mustard seed has been employed with success to check vomiting.

SISYMBRIUM NASTURTIUM. *E.*

Common Water Cresses. The Recent Herb.

This plant is perennial, and grows wild in clear springs and rivulets throughout Britain. Its leaves remain green all the year, but are in greatest perfection in the spring. They have a quick pungent smell (when rubbed betwixt the fingers,) and an acrid taste, similar to that of scurvy-grass, but weaker. By drying or boiling, it loses its sensible qualities entirely.

Medical use.—It acts as a gentle stimulant and diuretic: for these purposes, the expressed juice, which contains the peculiar taste and pungency of the herb, may be taken in doses of an ounce or two, and continued for a considerable time.

SIUM NODIFLORUM. *D.*

Procumbent Water Parsnip. The Herb.

This plant is perennial, and grows wild in rivers and ditches in England. It was formerly alleged to be not only a diuretic, but also an emmenagogue and lithontriptic. With these intentions, however, it is not now employed. Dr. Withering mentions, that a young lady of six years old, was cured of an obstinate cutaneous disease by taking three large spoonfuls of the juice twice a day; and he adds, that he has given repeatedly to adults three or four ounces every morning, in similar complaints. In such doses it neither affects the head, stomach, nor bowels. Children take it readily when mixed with milk.

SARSAPARILLA. *A.* SMILAX SARSAPARILLA. *E. L. D.*

Sarsaparilla. The Root.

This root is brought from the Spanish West-Indies. It consists of a great number of long strings hanging from one head: the long roots, the only part made use of, are of a blackish colour on the outside, and white within, about the thickness of a goose-quill, or thicker, flexible, composed of a very small woody heart, surrounded with fibres running their whole length, which renders them extremely apt to split. They have a glutinous, bitterish, not ungrateful taste, and no smell. Inferior kinds of this root are also sold. They are in general thicker, of a paler colour on the outside, and less white within, with a much thicker woody heart. Neumann got from 960 grains, 360 watery, and 10 alcoholic extract; and inversely, 240 alcoholic, and 120 watery.

Medical use.—It was first brought into Europe by the Spaniards, about the year 1563, with the character of being a specific for the cure of the lues venerea, a disease which made its appearance a little before that time, and likewise of several obstinate chronic disorders. It is, however, a very inert, mucilaginous substance; and the diaphoresis, which it is sometimes supposed to produce, is entirely owing to the warm and diluent regimen employed at the same time. More recently, however, it has come into favour for the cure of many cutaneous affections, and especially of syphiloid diseases; and if upon just grounds, it will explain why it should have been so strongly recommended in syphilis, and why it should have failed.

SODA.—*SODA.*

Sodium, the base of soda, resembles in its appearance silver, has great lustre, and is a conductor of electricity. It fuses at 200° Fahrenheit. It is not volatilized by the heat which melts plate glass. Its specific gravity is 0.9348, water being 1. It absorbs oxygen slowly from the atmosphere, and at a high temperature burns with bright sparks. It decomposes water with effervescence, and is inflamed by nitrous acid.

Protoxyd of sodium, scarcely known; of a dark grey colour.

Soda, of a grey colour, and vitreous fracture, a non-conductor of electricity.

Hydrat of soda, formerly considered as pure soda, contains 22 *per cent.* of water, which cannot be separated by heat, of a greyish white colour, urinous taste, and burning causticity, acting with considerable violence on animal matter. Water, in a certain proportion, when thrown upon it, is absorbed and solidified, with the disengagement of caloric, and a lixivial smell. A larger quantity dissolves

it. From the atmosphere it absorbs moisture and carbonic acid, becoming less caustic. In the fire it melts like an oily substance; boils, and is converted into vapour, but is incombustible. It is crystallizable into transparent prismatic crystals. It changes vegetable blues to green; unites with all the acids, oils, sulphur, sulphureted hydrogen, phosphorus, many metallic oxyds, and the earths. It forms the basis of rock-salt, and sea-salt; is obtained from the ashes of marine plants, and exists in some minerals.

Chloride of sodium, (muriat of soda,) consists of one proportion of sodium and two of chlorine. It is a non-conductor of electricity. It fuses in a strong red heat, and volatilizes in a white heat. It crystallizes in cubes. It is decomposed by potassium, which attracts its chlorine.

Sodium readily forms sulphurets and phosphurets, which are less inflammable than those of potassium.

Potassium and sodium combine readily in various proportions. A small quantity of potassium renders sodium brittle and very soft. A small quantity of sodium renders potassium fluid at a very common temperature, and reduces its specific gravity considerably.

Soda Impura. *L.* Carbonas Sodæ Impurus. *E.* Barilla. *D.*

Impure Carbonat of Soda. Barilla. Fixed Mineral Alkali.

Soda is a very common mineral production. It is the basis of sea-salt; and combined with carbonic acid, it is found on the surface of the earth in Egypt, Syria, Barbary, Hungary, &c. and is obtained by the incineration of marine vegetables, especially the salsola soda and kali, the salicornia herbacea, &c. The Spaniards even cultivate these in salt marshes for the sake of the soda. After being cut down, they are dried like hay. A deep pit is then prepared, and a bundle or two of the dried vegetables set on fire are thrown into it. When well kindled, other bundles are thrown in until the pit is filled. When the incineration is completed, the soda is found in the bottom, caked into a solid mass, which is worked like a stony substance. When good, it is firm, hard, heavy, dry, sonorous, spongy, and internally of a blue colour mixed with white spots, does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter. Incinerated soda is mixed with potass, muriat of soda, and other saline matters; mineral soda with clay and other earthy substances. The Egyptian soda was reckoned the best; then the Spanish (Barilla); afterwards the Carthaginian; and that prepared from different species of fuci (kelp), is the worst.

But all these carbonated sodas are inferior in purity to those now manufactured in Britain, by decomposing the sulphat of soda.

That commonly used, is obtained by the bleachers as a residuum in their method of preparing oxygenized muriatic acid, by decomposing muriat of soda with sulphuric acid and the black oxyd of manganese.

The sulphat of soda is decomposed,

1. By carbonat of potass. Mr. Accum has described the manipulations of this mode. A boiling concentrated solution of about 560 pounds of American potashes is ladled into a boiling solution of 500 pounds of sulphat of soda, agitated together, and the whole quickly heated to ebullition. It is then drawn off into leaden cisterns, lined with thick sheet-lead, and allowed to cool in a temperature which should not exceed 55°.

   The fluid is then drawn off, and the mass of salt washed with cold water, to free it from impurities, and again put into the boiler with clean water. This second solution is also evaporated at a low heat, as long as any pellicles of sulphat of potass form on its surface, and fall to the bottom of the fluid. The fire is then withdrawn, and the fluid ladled out into the cistern to crystallize. Unless the fluid be allowed to cool pretty low before it is removed to crystallize, the salt obtained will contain sulphat of potass.
2. By acetat of lime. The acetic acid for this purpose is obtained by distillation from wood, during its conversion into charcoal.
3. By litharge or sub-acetat of lead. Very pure carbonat of soda is prepared by this process in the vicinity of Edinburgh.
4. By decomposing the sulphuric acid by charcoal. About 500 weight of sulphat of soda, and 100 weight of charcoal, are ground together, and the mixture exposed in a reverberatory furnace until it becomes pasty. It is then transferred into large casks, and lixiviated. The ley is afterwards evaporated and crystallized. By this, or a similar process, very pure carbonat of soda is manufactured in the west of Scotland.

On the continent, muriat of soda is sometimes decomposed by potass, and sometimes by lime.

Carbonat of soda is an article of the greatest importance in many manufactures.

Medical use.—In medicine, it possesses similar virtues with the carbonat of potass; and from its crystallizability and efflorescence when exposed to the air, it is preferable to it, because its dose may be more accurately ascertained, aud it may be given either in the form of powder, or made up into pills.

SODÆ SUBCARBONAS. *A. E. D. L.* Sal Sodæ.

Subcarbonat of Soda.

Take of

Impure carbonat of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled, the salt may crystallize.

These directions are principally intended for the purification of the Spanish barilla, which is a fused mass, consisting indeed principally of carbonat of soda, but also containing charcoal, earths, and other salts. From the two first causes of impurity it is easily separated by solution and filtration, and the salts may be separated by taking advantage of their different solubility in cold and in hot water. Frequently the soda does not crystallize freely, from not being saturated with carbonic acid, which is the reason why the London College order the solution to be exposed to the atmosphere for eight days, that it may absorb carbonic acid, before they attempt the crystallization of the salts. But the preparation of carbonat of soda, by the decomposition of sulphat of soda, has now become a manufacture, and is carried to such perfection, that its further purification is almost unnecessary for the purposes of the apothecary.

The primitive form is an octohedron, with a rhombic base of 60° and 120°, the planes of which meet at the summit at 104, and at the base at 76°.

There are two distinct compounds of carbonic acid and soda, the one containing precisely half as much carbonic acid as the other. The first, or subcarbonat, is obtained by carefully recrystallizing the soda of commerce.

If 100 grains of the salt be slowly added to a quantity of diluted sulphuric acid, more than sufficient for saturation, and of known weight, the loss of weight will show the quantity of carbonic acid contained in 100 grains. From experiments of this kind, joined with others on its loss by fusion, Berard deduces its composition to be

Acid,	13.98	100	60
Base,	23.33	166	100
Water,	62.69		
	100.		

Independently of the water of crystallization, its composition has been differently stated, viz. 100 grains contain

	Acid.	Base.
According to Berard,	37.50	62.50
——— Dulong,	40.09	59.91
——— Dalton,	40.40	59.60
——— Klaproth,	42.	58.
——— Kirwan,	40.10	59.90

Its atomic constitution is supposed by Mr. Dalton to be one atom of soda with one atom of carbonic acid.

When a solution of the subcarbonat of soda is saturated, by passing through it a stream of carbonic acid gas, or when a solution of 100 parts of the salt are heated with one of fourteen parts of subcarbonat of ammonia, we obtain by evaporation an indistinctly crystallized salt, which is the *bi-carbonat of soda.* The taste of this salt is much milder than that of the subcarbonat; and it requires a much larger quantity of water for solution. To bring soda to this state of

saturation, 100 parts of the alkali require 125.33 of carbonic acid. The bi-carbonat is, therefore, composed, in 100 parts,

	Acid.	Base.	Water.
According to Berard, of	49.95	29.85	20.20
———— Rose,	49.	37.	14.

And as the acid in this salt is, as nearly as possible, double that of the subcarbonat, it must be constituted of two atoms of acid and one atom of soda. By exposure to a red heat, the whole of its water, and half its carbonic acid, are expelled, and it is converted into the dry subcarbonat.

SODÆ CARBONAS. *A. L. E.* *Carbonat of Soda.*

Take of
- Subcarbonat of soda, ... one pound;
- Subcarbonat of ammonia, . . . three ounces;
- Distilled water, ... one pint.

Add the ammonia to the subcarbonat of soda dissolved in the water; then apply a heat of 180°, in a sand bath, for three hours, until all the ammonia be expelled. Lastly, set it aside to crystallize.
In the same manner evaporate the residuary liquor, and set it aside again to crystallize.

This salt bears the same relation to the subcarconat of soda that the carbonat of potass does to its subcarbonat. Klaproth first described it, and says it consists of 39 carbonic acid, 38 soda, and 23 water. It is found native in hard striated masses in the province of Sukena, in Africa, and is called *trona*.

Mr. Phillips objects on calculation to the quantity of carbonat of ammonia employed, as unnecessarily too large; for in subcarbonat of soda, the alkali is to the acid as three to two, and in the carbonat they are equal, and in 100 parts of crystals of subcarbonat are 35 of salt, consisting of 21 soda and 14 acid, requiring therefore 7 additional acid to neutralize it. Now, as 100 carbonat of ammonia contains 50 acid, it follows, that 14 will furnish the necessary acid, and that 25, the quantity ordered by the college, is excessive.

SODÆ SUBCARBONAS EXSICCATUS. *A. L.*

CARBONAS SODÆ SICCATUM. *D.*

Dried Subcarbonat (Carbonat. D.) of Soda.

Take of
- Subcarbonat of soda, any quantity.

Apply to it a boiling heat in a clean iron vessel until it becomes perfectly dry, and at the same time constantly stir it with an iron rod. Lastly, reduce it to powder.

Subcarbonat of soda, deprived of its water of crystallization, is a very excellent remedy, for which we are indebted to Dr. Bed-

does: he desires it to be prepared by simply exposing the pounded crystals before the fire; which appears to be preferable to the process directed by some of the colleges, in which much of the carbonic acid may be expelled. By simple efflorescence, crystallized carbonat of soda loses more than half is weight, and falls down into a fine permanent powder. Whenever soda is prescribed in the form of pills, the effloresced carbonat is to be used, as, when made of the crystallized salt, they crack, and fall to pieces by the action of the air upon them.

Medical use.—Dr. Beddoes first recommended the powder of effloresced soda, in calculous complaints, as a substitute for the supercarbonated alkaline waters, when these produced giddiness, or were too expensive: but its use has since been extended much farther; and it is found to be, not only an excellent antacid, but seems almost to possess specific virtues in affections of the urinary organs. One or two scruples may be given, in the course of the day, in the form of powder, or in pills, made up with soap and some aromatics.

Aqua Super Carbonatis Sodæ. *E.*

Solution of Super-Carbonat of Soda.

Aqua Sodæ. *A.* ! ! *Soda Water.*

This is prepared from ten pounds of water, and two ounces of carbonat of soda, in the same manner as the water of super-carbonat of potass.

By supersaturating soda with carbonic acid, it is rendered more agreeable to the palate, and may be taken in larger quantities, without affecting the stomach. This is now in common use as a cooling beverage, under the title of soda-water; and it may not be unnecessary to mention, that its place cannot be at all supplied by what is sold as soda powder, which is not a supercarbonat of soda, but merely a mixture of salts, which effervesces on being dissolved. Indeed, one moment's reflection must show the impossibility of reducing to a solid form, a salt which cannot exist in solution, except under very great pressure.

What are called *sodaic powders*, as prepared in Great Britain, are contained in two distinct papers, the one blue, the other white; the powder contained in the former, consists of half a drachm of *carbonat of soda;* that in the latter, of twenty-five grains of *tartaric acid.* These powders require half a pint of water. It is evident, that what is thus drank is not soda water, which is a solution of super-carbonated soda; whereas the solution of the *sodaic powders,* is a *tartrat of soda*, with a small portion of carbonic acid diffused through it.

The *patent Seidlitz powders*, in like manner, consist of two drachms of *tartarized soda*, and two scruples of *carbonat of soda* in white paper; and thirty-five grains of *tartaric acid* in a blue paper. The former is dissolved in half a pint of water, and the latter is then added to it; it is drank in the state of effervescence.

SODÆ PHOSPHAS. *A. E. D.* *Phosphat of Soda.*

Take of
 Bones burnt to whiteness, and powdered, . . . ten pounds;
 Sulphuric acid, ... six pounds;
 Water, ... nine pounds.

Mix the powder with the sulphuric acid in an earthen vessel; then add the water, and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out. Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, add carbonat of soda, dissolved in warm water, until the effervescence cease. Filter the neutralized liquor, and set it aside to crystallize. To the liquor that remains after the crystals are taken out, add a little carbonat of soda, if necessary, so as to saturate exactly the phosphoric acid, and dispose the liquor, by evaporation, to form crystals. Lastly, the crystals are to be kept in a well-closed vessel.

The first part of this process consists in destroying the gelatin of the bones by the action of heat. When burnt to perfect whiteness, they retain their form, but become friable, and consist of phosphat of lime, mixed with a very little carbonat of lime and carbonat of soda. In performing this part of the process, we must take care not to heat the bones to a bright red, as by it they undergo a kind of semi-fusion, and give out a phosphoric light. The complete combustion of the charcoal is facilitated by the free contact of the air; we must therefore bring every part in succession to the surface, and break the larger pieces.

In the second part of the process, the phosphat of lime is decomposed by the sulphuric acid. This decomposition is however only partial. The sulphuric acid combines with part of the lime, and forms insoluble sulphat of lime. The phosphoric acid separated from that portion of lime, immediately combines with the rest of the phosphat of lime, and forms super-phosphat of lime, which is not further decomposable by sulphuric acid.

The super-phosphat of lime, thus formed, is soluble in water; but as the sulphat of lime, with which it is mixed, concretes into a very solid mass, it is in some measure defended from the action of water. On this account the whole mass is directed to be digested for three days in vapour, by which means it is thoroughly penetrated and prepared for solution in the boiling water, which is afterwards poured on it. It is probably to render the subsequent solution easier, that Thenard directs the bone-ashes to be made into a thin paste (*bouille*) with water, before the sulphuric acid is added to them.

Having thus got a solution of super-phosphat of lime, it is next decomposed by carbonat of soda, dissolved in water. This decompo-

sition, likewise is only partial, as it deprives the super-phosphat of lime of its excess of acid only, and reduces it to the state of phosphat. The phosphat of lime, being insoluble, is easily separated by filtration, and the phosphat of soda remains in solution. According to Thenard, the nicest point in the whole process is the determination of the proper quantity of carbonat of soda to be added. As the phosphat of soda does not crystallize freely unless there be a slight excess of base, he directs that a little more carbonat of soda be added than what is merely sufficient to saturate the excess of acid in the super-phosphat of lime, but not to continue the addition until it cease to produce any precipitate. We must also take care not to carry the evaporation of a solution of phosphat of soda so far as to form a pellicle, for it then concretes into an irregular mass, and does not form beautiful crystals. After each crystallization, we must examine the liquor which remains, and if it be acid, or merely neutral, add to it a little of the solution of carbonat of soda. In this way Thenard got from 2100 parts of bone-ashes, 700 of sulphuric acid, and 667 of carbonat of soda, 885 of phosphat of soda. According to Fourcroy, phosphat of lime consists of 0.41 acid and 0.59 lime ; and super-phosphat of lime, of 0.54 acid and 0.46 lime ; phosphat of lime, treated with sulphuric acid, is only deprived of 0.24 lime, and changed into 0.76 of super-phosphat, consisting of 0.59 phosphat of lime, and 0.17 phosphoric acid, and it is only with this portion of acid that we are able to combine soda. Fourcroy is also of opinion that phosphat of lime requires only 0.4 of its weight of sulphuric acid to decompose it, whereas 0.6 are employed by the Edinburgh College, and others use even 0.7. This is not only, therefore, a waste of acid, but renders the product impure, by being mixed with sulphat of soda, which is sometimes actually the case in the phosphat of soda of commerce. Besides, as bone-ashes are of very little value, it is better that a portion of them should escape undecomposed than that an excess of acid should be added to them.

Mr. Funcke, of Linz, has discovered a still more economical and expeditious method. It consists in saturating the excess of lime in calcined bones with diluted sulphuric acid, and then dissolving the remaining phosphat of lime in nitric acid. To this solution he adds an equal quantity of sulphat of soda, and then recovers the nitric acid by distillation. The phosphat of soda is then separated from the sulphat of lime, by the affusion of water and crystallization.

Phosphat of soda crystallizes in rhomboidal prisms, terminated by three-sided pyramids. Its taste resembles that of common salt. At 60° it is soluble in four parts of water, and at 212° in two. It effloresces in the air. By heat it undergoes the watery fusion, and at last melts into a white mass. It consists, according to Thenard, of 15 phosphoric acid, 19 soda, and 66 water of crystallization. It is decomposed by most of the salts having an earthy base.

Medical use.—Phosphat of soda was introduced into the practice of physic by the ingenious Dr. Pearson of London. It possesses the same medical qualities as sulphat of soda, and the tartrat of potass and soda; being an excellent purge in the quantity of an ounce or

ten drachms; and has the peculiar advantage over these two salts of being much less nauseous than they are. Its taste is extremely similar to that of common salt; and when given in a bason of water-gruel, or veal-broth made without salt, it is scarcely perceptible by the palate, and consequently it is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other salts. The only objection to its general use is the very great difference between its price and that of sulphat of soda, a difference which might certainly be diminished.

MURIAS SODÆ. *A. E. L. D.* Sal Commune.

Muriat of Soda. Common Sea Salt. Salt.

This is the most common of all the neutral salts. It is not only found in immense masses, on and under the earth's surface, and contained in great quantities in many salt springs, but it is the cause of the saltness of the sea.

Native muriat of soda presents two varieties, the lamellar and fibrous. It is found in Poland, Hungary, Spain, England, &c. When not perfectly pure, it is purified by solution and crystallization.

Salt springs occur in many parts of the world. The quantity of muriat of soda contained in these varies, from an inconsiderable quantity, even up to one third.

Sea-water also varies much in strength. It is said to contain most salt in warm climates, and at great depths.

Muriat of soda, as obtained from these natural solutions of it by evaporation and crystallization, is seldom pure, but commonly mixed with earthy muriats, which being deliquescent salts, dispose it to attract moisture from the atmosphere. It may, however, be purified by precipitating the earths by means of carbonat of soda, or by washing the crystallized salt with a saturated solution of muriat of soda, heated to ebullition. In this state it is not capable of dissolving any more muriat of soda, but will dissolve a considerable quantity of the earthy muriats.

Muriat of soda has a pure salt taste, is soluble in 2.8 times its weight of water at 60°, and in 2.76 at 212°. It is not soluble in alcohol. By the action of heat it first decrepitates, then melts, and lastly, sublimes without decomposition. The primitive form of its crystals is cubic, and they are permanent in the atmosphere. According to Kirwan, they consist of 38.88 muriatic acid, 53 soda, and 8.12 water. It is decomposed by the sulphuric and nitric acids, by potass and baryta, by secondary salts containing these, and by metalline salts, whose base forms an insoluble compound with muriatic acid. It is also gradually decomposed by lime, iron, and litharge.

Medical use.—Muriat of soda is one of the most important articles in the arts, and in domestic economy. As a medicine, it is useful in some cases of dyspepsia; and in large doses it is said to check voiting of blood. It is a common ingredient in stimulating clysters,

and is sometimes applied externally as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body.

SODÆ MURIAS EXSICCATUS. *A.*

Murias Sodæ Siccatum. *D.* *Dried Muriat of Soda.*

Take of
Muriat of soda, any quantity.
Roast it over the fire in an iron vessel, loosely covered, until it cease to decrepitate, agitating it from time to time.

By this process the muriat of soda is reduced into the state in which it is employed for the distillation of muriatic acid. It not only deprives it entirely of its water of crystallization, which, from being variable in quantity, would otherwise render the acid obtained unequal in strength, but also destroys some colouring matter it contains; for if we prepare muriatic acid from crystallized muriat of soda, we obtain a coloured muriatic acid, while the dried muriat furnishes a perfectly colourless one.

SULPHURETUM SODÆ. *A.* *Sulphuret of Soda.*

Take of
Sulphur,
Dried subcarbonat of soda, of each, one ounce.
Prepare it in the same manner as sulphuret of potass.

SODÆ SUB-BORAS. *A.* Sodæ Boras. *L. E.* Borax. *D.*

Borat of Soda. Sub-borat of Soda. Borax.

Borax is found only in Thibet and Persia. It exists in the water of some wells and lakes, and is extracted from them by evaporation. In its impure state it is called tincal, and is brought from the East-Indies in great masses, composed of a few large crystals, but chiefly of smaller ones, partly white and partly green, joined together as it were by a greasy yellow substance, intermixed with sand, small stones, and other impurities. By repeated solutions, filtrations, and crystallizations, it shoots into hexangular prisms, of which two sides are broader than the others, terminated by triangular pyramids, of a white colour, a styptic and alkaline taste, colouring vegetable blues green, soluble in eighteen parts of water at 60°, and in six at 212°, slightly efflorescing in the air, and when heated, swelling, and, with the loss of nearly half its weight, forming a porous, friable mass, which, in a greater heat, melts into a transparent glass soluble in water. Besides the acids and alkalies, which have a greater affinity for its acid or base than these have for each other, it is decomposed by sulphats, muriats, nitrats, phosphats, and fluats of all the earths and of ammonia. It consists of 39 boracic acid, 17 soda, and 44 water.

Boracic acid exists in the form of small, shining, laminated crystals. Specific gravity is 1.479. It is fixed and vitrifiable in the fire. It is soluble in fifty parts of boiling water. It is also soluble in alcohol, to which it imparts the property of burning with a yellow flame. It oxydizes only iron and zinc.

Borats are vitrifiable; and their concentrated solutions afford, when heated with the strong sulphuric acid, brilliant, lamellated crystals.

Medical use.—The medical virtues of borax have not been sufficiently ascertained by experience: it is supposed to be, in doses of half a drachm or two scruples, diuretic, emmenagogue, and a promoter of delivery. Mr. Bisset, in an essay on the medical constitution of Great Britain, recommends a solution of this salt in water, as the most powerful dissolvent yet known, of aphthous crusts in the mouth and fauces of children. And for the same purpose also, a small quantity of it is often applied in the form of powder mixed up with sugar. There are strong reasons to believe, that the virtues of borax are much greater than they are in general supposed to be; and that it may be more extensively used with advantage.

SODÆ SULPHAS. *A. L. D. E.*

Sulphat of Soda. Glauber's Salt.

Dissolve the acidulous salt which remains after the distillation of muriatic acid, in water; and having mixed chalk with it, to remove the superfluous acid, set it aside until the sediment subsides, then evaporate the liquor decanted from them, and strain through paper, so that it may crystallize.

The observations made respecting the different methods followed by the colleges, for extracting sulphat of potass from the residuum of the distillation of nitrous acid, apply in the present instance, except that the Edinburgh college do not preserve the superabundant acid when present, by saturating it with carbonat of soda, but get rid of it by saturating it with carbonat of lime, with which it forms an insoluble sulphat of lime. In fact, the price of sulphat of soda is so very small, that it would be no economy to use carbonat of soda to saturate the superabundant acid.

By far the greatest part of the sulphat of soda is obtained from manufacturers, as a result of processes performed for the sake of other substances, as in the preparation of muriat of ammonia, oxygenized muriatic acid, &c. It may be economically obtained by making into a paste with a sufficient quantity of water, eight parts of burnt gypsum, five of clay, and five of muriat of soda. This mixture is burnt in a kiln or oven, then ground to powder, diffused in a sufficient quantity of water, and after being strained, is evaporated and crystallized.

Sulphat of soda crystallizes in six-sided prisms, terminated by dihedral summits. The crystals are often irregular, and their sides

are usually channeled. Their taste is at first salt, and afterwards disagreeably bitter. They are soluble in 2.67 parts of water at 60°, and in 0.8 at 212°. In the air they effloresce. They undergo the watery fusion, and in a red heat melt. They consist of 23.52 sulphuric acid, 18.48 soda, and 58. water,* when dried at 700°, of 56 acid and 44 soda. It is decomposed by baryta and potass, and salts containing these bases, and by the salts of silver, mercury, and lead.

Medical use.—Taken from half an ounce, to an ounce, or more, it proves a mild and useful purgative; and in smaller doses, largely diluted, a serviceable aperient and diuretic. It is commonly given in solution, but it may also be given in powder, after it has effloresced. In this form the dose must be reduced to one half.

SOLIDAGO. *A.* (*Secondary.*) *Golden Rod. The Leaves.*

SOLIDAGO VIRGA AUREA. *D.*

Common Golden Rod. The Flowers and Leaves.

This plant is perennial, and is found wild on heaths and in woods, producing spikes of yellow flowers in August. The leaves have a moderately astringent bitter taste; and hence prove serviceable in debility and laxity of the viscera, and disorders proceeding from that cause.

SOPHORA TINCTORIA. *Linn.* PODALYRIA TINCTORIA. *Mich.*

Wild Indigo. Indigo Weed. The Root and Plant.

This vegetable is indigenous, and supposed to be exclusively American. In Dr. Cutler's catalogue it is called *Indigo fera*, and it is sometimes known by the name of *broom*, but more commonly *Indigo weed.* It is perennial, growing in great abundance in almost every barren pasture, and in woods. The stalk rises to two feet or more, sending off numerous branches. The leaves are small, ternate, inversely heart-shaped, and sessile. In July and August all its branches display butterfly shaped, golden coloured blossoms, which render the plant very conspicuous. The seed vessels are inflated, containing numerous seeds. The root is ligneous, rough, and irre-

* This immense quantity of water of crystallization may be well dispensed with on various occasions, as for the army or navy. By efflorescence, the salt is converted into a fine dry powder of half its original bulk and weight, and no way injured in its medical properties. It is also by this means prevented from injuring the adjoining medicines, or any instruments of surgery.

gular in shape, of a dark brown colour externally, and sending off many long, slender branches. Its taste is unpleasant, subacrid, and nauseous, very similar to that of ipecacuan. The particular medical properties of indigo weed are yet to be ascertained; that it possesses great activity, is unquestionably true; those who in the spring season have made the young shoots a substitute for asparagus, experienced its drastic, evacuating powers. In the hands of some physicians it is found to operate in a large dose, with much severity as an emetic and cathartic. But a weak decoction of the root has frequently been given with the effect only of a mild laxative. A decoction of the bark of the root has, it is said, been made known by an empiric experienced in its use, as a remedy in scarlatina anginosa, and its employment has been extended in a few instances, to typhus or putrid fever, with such good effect, as to encourage farther trials. An experienced physician considers it as an excellent antiseptic and febrifuge, preferring it, in some fevers, to Peruvian bark. As an external application, its antiseptic qualities ought to be more extensively known. In the form of fomentation or cataplasm, it has proved eminently beneficial when applied to phagedenic and gangrenous ulcers, especially if the decoction be administered internally at the same time.

A liniment prepared by simmering the *cortical part* of the root in cream, has been found an efficacious application to sore nipples and ulcerated breasts. A violet, or pale blue colour, has been prepared from the leaves and small branches of this plant, and used as a substitute for indigo. The leaves turn black when dried.

SPARTIUM SCOPARIUM. *E. L. D.*

Common Broom. The Tops and Seeds.

This is a very common shrub on dry pastures.

The leaves have a very bitter taste, and when given in decoctions, prove considerably diuretic. The seeds have similar properties.

SPIGELIA. *A.* SPIGELIA MARILANDICA. *L. E. D.*

Carolina Pink. Indian Pink-Snake Root. The Plant and Root.

Pentandria Monogynia.—Nat. ord. *Stellatæ.*

This plant is perennial, and grows wild in North America, from Maryland to East Florida. The roots are celebrated as an anthelmintic, particularly for the expulsion of lumbrici from the alimentary canal. Some order it in doses of ten or fifteen grains; and al-

lege it is apt to occasion nervous affections, if given in large doses; while others order it in drachm doses, alleging that the bad effects mentioned, more readily happen from small doses, as the large one often purges or pukes; some prefer the form of infusion. An emetic is generally premised; and its purgative effect, assisted by some suitable addition. Infused in wine, it has been found useful in intermitting fevers. This plant in some parts of Carolina is known by the name of Snake-root. It is the Unsteetla of the Cherokee Indians. Every part is possessed of the anthelmintic property, though the roots are most active. It exerts a narcotic and laxative effect. By the former, it appears to destroy the worms; and by the latter, it speedily expels them. It often affords relief and effects a cure, in cases where no worms are discharged; and it is supposed by Dr. Barton, that it will be found highly useful in some febrile diseases of children, unaccompanied by worms, especially in the insidious remittent, which so frequently lays the foundation of dropsy of the brain.* By some, the disagreeable effects arising from its administration, are attributed to a parasitic plant, which winds itself around the stalk, and which is said to be a species of Glycine.

Experiments show its safety, in much larger doses than are usually given; from one to two drachms may be safely administered to an adult; and it is highly probable that its good effects are disputed by some, merely from the small doses in which it has been recommended.

The following extract of a letter from Mr. Porcher, student of medicine, in reference to the vine which has been supposed to give the affirmed noxious qualities to the spigelia, may not be unacceptable.

"I am told by a gentleman, who had an opportunity of examining more than two hundred specimens, that he rarely met with the vine you mentioned, and that when he did, it was found growing on other plants in the neighbourhood: also, I requested a friend to inquire of Mr. Stephen Elliott, who is of opinion, that the poisonous quality resides in the plant itself."

SPIRITUS DISTILLATI.

DISTILLED SPIRITS.

The flavour and virtues of distilled waters are owing, as has been observed, to their being impregnated with a portion of the essential oil of the subject from which they are drawn. Alcohol, considered as a vehicle for these oils, has this advantage above water, that it keeps all the oil that rises with it perfectly dissolved into an uniform limpid liquor.

* Barton's Collections, Part I. p. 37. 59.

Nevertheless, many substances, which, on being distilled with water, impart to it their virtues in great perfection; if treated in the same manner with alcohol, scarcely give over to it, any smell or taste. The cause of this difference is, that alcohol is not susceptible of so great a degree of heat as water. It is obvious, therefore, that substances may be volatile enough to rise with the heat of boiling water, but not with that of boiling alcohol.

Thus, if cinnamon, for instance, be committed to distillation with a mixture of alcohol and water, or with a pure proof spirit, which is no other than a mixture of about equal parts of the two; the alcohol will rise first clear, colourless, and transparent, and almost without any taste of the spice; but as soon as the more ponderous watery fluid begins to arise, the oil comes freely over with it, so as to render the liquor highly odorous, sapid, and of a milky hue.

The proof spirits, usually met with in the shops, are accompanied with a degree of ill flavour; which, though concealed by means of certain additions, plainly discovers itself in distillation. This nauseous flavour does not begin to arise till after the purer spirituous part has come over; which is the very time that the virtues of the ingredients begin also to arise most plentifully; and hence the liquor receives an ungrateful taint. To this cause, principally, is owing the general complaint, that the cordials of the apothecary are less agreeable than those of the same kind, prepared by the distiller; the latter being extremely curious in rectifying, or purifying the spirits, (when designed for what he calls fine goods) from all unpleasant flavour.

General Directions for Distilled Spirits.

To the substance to be distilled, add nine pints of weaker alcohol. Macerate for two days in a close vessel; then pour on as much water as will prevent empyreuma, and draw off nine pints.

Spiritus Carui. *E. L. D.* *Spirit of Caraway.*

Take of
Caraway seeds, bruised, . . . half a pound;
Diluted alcohol, ... nine pounds.

Macerate two days in a close vessel; then pour on as much water as will prevent empyreuma, and draw off by distillation nine pints. *E.*

In the same manner prepare the like amount of spirit from

Cinnamon, one pound.	*Spiritus Cinnamomi. E. L. D.*
Peppermint, one pound and a half.	*Menthæ Piperitæ. E. L.*
Spearmint, one pound and a half.	*Menthæ Viridis. L.*
Pennyroyal, one pound and a half.	*Pulegii. L.*
Nutmeg, bruised, two ounces. .	*Myristicæ. L. E.* / *Nucis moschatæ. D.*
Pimento, half a pound.	*Pimentæ. E. L. D.*
Aniseed, bruised, half a pound.	*Anisi. L.*

SPIRITUS JUNIPERI COMPOSITUS. *A. E. L. D.*

Compound Spirit of Juniper.

Take of
Juniper, bruised, ... one pound;
Caraway, bruised,
Fennel, bruised, each, . . one ounce and a half;
Diluted alcohol, ... nine pints.
Macerate for two days; and having added enough water to prevent empyreuma, distil off nine pints.

SPIRITUS LAVANDULÆ. *A. E. L. D.* *Spirit of Lavender.*

Take of
Fresh lavender, . . . two pounds;
Alcohol, ... one gallon.
Macerate for twenty hours; and having added enough water to prevent empyreuma, distil off a gallon.

SPIRITUS RORISMARINI. *A. E. L.* *Spirit of Rosemary.*

Take of
Fresh rosemary, . . . two pounds;
Alcohol, ... one gallon.
Macerate for twenty-four hours, and having added enough water to prevent empyreuma, distil off a gallon.

It is unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol. The alcohol in the spirits of lavender and rosemary, is almost pure; in the others it is diluted with about an equal weight of water.

SPIRITUS ANISI COMPOSITUS. *D.* *Compound Spirit of Aniseed.*

Take of
Aniseed,
Angelica seed, of each, bruised, . . . half a pound;
Proof spirit, ... one gallon;
Water, sufficient to prevent empyreuma.
Draw off one gallon by distillation. *L.*

This compound spirit, like the simple ones, is an agreeable cordial; indeed too agreeable: for by some they are so often resorted to, on the slightest sensation of flatulence in the stomach, that their use is attended with all the pernicious consequences of dram-drinking.

Spiritus Raphani Compositus. *D.*

Spiritus Armoraciæ Compositus. *L.*

Compound Spirit of Horse-Radish.

Take of
- Fresh horse-radish root,
- Dried outer rind of Seville oranges, each, . . . two pounds;
- Fresh herb of garden scurvy-grass, ... four pounds;
- Bruised nutmegs, ... one ounce;
- Proof spirit, ... two gallons;
- Water, sufficient to prevent empyreuma.

Draw off two gallons. *D.*

Although this process may furnish an agreeable compound spirit, yet it is much to be doubted whether it possesses those anti-scorbutic powers for which it was once celebrated.

SPIRÆA. *A.* (*Secondary.*) *Hardhack. The Root.*

SPONGIA. *A. E. L. D.* Spongia Officinalis. *Sponge.*

Sponge is principally found in the Mediterranean and Red seas. It was long supposed to be a vegetable production, but it is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs. The sponges belong to that division of the zoophytes, which are attached to a solid trunk, and are particularized by their base being spongy, friable, or fibrous.

Sponge is a soft, light, very porous and compressible substance, absorbing by capillary attraction a large proportion of any fluid in which it is immersed.

Medical use.—From these properties, it is an useful substance in the practice of surgery. When applied to ulcers which are accompanied with a copious discharge, it absorbs the thinner and more acrid fluid, and leaves the ulcers covered with the thicker and blander matter. It is also useful in suppressing hæmorrhages, when properly applied by compression, by favouring the coagulation of the blood at the mouths of the vessels. It also forms a convenient tent for dilating wounds and fistulous ulcers, especially when prepared by immersing it in melted wax, and keeping it compressed until it cools. On the melting of the wax by the heat of the part to which it

is applied, it gradually expands, and affords an uniform and gently dilating pressure.

Burnt sponge is nothing else than charcoal mixed with a little muriat of soda and phosphat of lime, together with a small portion of Iodine. Its use has been again lately much celebrated in the cure of bronchocele.

If sponge be cut in small pieces, fried, or dipped in honey, or salt butter, and given to rats, it distends their bowels, and effectually destroys those animals.

SPONGIA USTA. *A. L. D.* *Burnt Sponge.*

Cut the sponge in pieces, and bruise it, so as to free it from small stones; burn it in a close iron vessel, until it becomes black and friable; afterwards reduce it to a very fine powder.

This medicine has been in use for a considerable time, and employed against scrofulous disorders and cutaneous foulnesses, in doses of a scruple and upwards. Its virtues probably depend on the presence of a little alkali. It also contains charcoal; and its use may be entirely superseded by these substances, which may be obtained in other manners, at a much cheaper rate.

STANNUM.—*TIN.*

Tin is pure brilliant, white, sapid, and odorous; specific gravity 7.291 to 7.500, soft, flexible, and emitting a crackling noise when bent; fusing at 442° Fahrenheit; oxydizes slowly in the air; is converted, when fused, into a grey oxyd; when red hot it burns vividly. Its sulphuret and phosphuret are lamellated and brittle; it forms alloys with arsenic, bismuth, antimony, mercury, and zinc; it is oxydized by many acids, and combines with the muriatic, fluoric, boracic, and carbonic acids. Its oxyd is grey or white, unites readily with sulphur, and renders glasses opaque.

It is found,

1. Sulphureted, and combined with copper. Tin-pyrites.
2. Oxydized.
   - *a.* Combined with oxyd of iron and silica. Common tin-stone.
   - *b.* Combined with oxyd of iron and a little arsenic. Fibrous tin-stone.

The best tin is found in Cornwall, or is brought from the East-Indies. Its purity is estimated by its small specific gravity, and by the crackling noise it makes when bent.

It is now only used as an anthelmintic, especially in cases of tæniæ, and probably acts mechanically.

PULVIS STANNI. *A. D.* *Powder of Tin.*

Take of
Tin, any quantity.
Melt it in an iron mortar; reduce it to powder, by agitation; and pass it, when cold, through a hair sieve.

The College of Edinburgh do not give this preparation, inserting *limatura et pulvis stanni* in their list of the materia medica.

Medical use.—It is often employed as a remedy against worms, particularly the flat kinds, which too often elude the force of other medicines. The general dose is from a scruple to a drachm; some confine it to a few grains. But Dr. Alston assures us, in the Edinburgh Essays, that its success chiefly depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartic is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them are removed almost immediately upon taking the first dose of the tin. This practice is sometimes successful in the expulsion of tæniæ, but by no means so frequently as Dr. Alston's observations would lead us to hope.

Blaine's powder, which certainly succeeds sometimes in curing the distemper in dogs, seems to be a sulphureted oxyd of tin.

PULVIS STANNI AMALGAMATIS. *A.*
Powder of the Amalgam of Tin.

Take of
Tin, ... five parts;
Purified mercury, ... two parts;
Prepared carbonat of lime, . one part.
Melt the tin, add to it the mercury, and rub them together; then add the carbonat of lime, and while the mixture is liquid, rub till the metallic particles disappear; lastly, while the mixture cools, reduce it to an impalpable powder.

This is a vague prescription;—we are not told in what the articles are to be rubbed, nor with what intention the carbonat of lime is added.

STATICE. *A.* Statice Limonium. S. Caroliniana.
Marsh Rosemary. Lavender Thrift. Sea Lavender. The Root.

This is well known in the New England States. It is indigenous and perennial, growing on the sea shore, in salt marshes; and the

fissures or clefts of rocks near the sea coast: it is in flower from July to September. The stem is naked, branched, and about a foot high. The radical leaves are long, pointed, and grow on foot stalks. The flowers are blue, and grow on long spikes on the tops of the branches. The roots of this plant are powerfully astringent. A decoction of them is given and used as a gargle with success in cankers and ulcerated sore throats. The late Dr. Hews, of Providence, held the root of this plant in high estimation in cases of aphthous states of fever accompanying dysentery, ulcerous sore throats, or *scarlatina anginosa*. He valued it as the greatest antiseptic he was acquainted with, and said he could administer it in cases where the bark was inadmissible.

Dr. William Baylies, of Dighton, in a communication to the Massachusetts Medical Society, makes favourable mention of this root from his experience in the ulcerated sore throat, as it appeared in that town in 1785 and 1786. This judicious physician observes, "Among the many medicines in high estimation with the common people, and used by them without the advice of the physicians, I know of none worth the least consideration, excepting the marsh-rosemary, or, as it is commonly called, marsh root. This in a large dose operates as a vomit; in a smaller, proves a powerful expectorant; and, from its sensible qualities, one would suppose it to possess considerable antiseptic powers. I am well assured it was the basis of a medicine used by a physician in Providence, with very great success in this complaint. It is undoubtedly of great efficacy, and deserves a more thorough investigation."

STYRAX OFFICINALE. *E. L. D.* *Storax.* *A Balsam.*

This tree grows in the Levant, and in Italy and France. The storax flows from wounds made in the bark, in countries where the heat is sufficient, for neither in France nor in Italy does it furnish any.

It is either in small distinct tears, of a whitish or reddish colour, or in large masses composed of such, or in masses of an uniform texture and yellowish red or brownish colour; though sometimes likewise interspersed with a few whitish grains.

The *common storax* of the shops is in large masses, considerably lighter and less compact than the foregoing; it appears on examination to be composed of a fine resinous juice, mixed with a quantity of saw-dust.

Storax has an agreeable smell, and an aromatic taste. Neumann got from 480 grains, 360 alcoholic, and 30 of watery extract; and inversely, 120 watery, and 240 alcoholic. In distillation it yielded benzoic acid. It is, therefore, a balsam, or natural combination of resin with benzoic acid.

Styrax Purificata. *L. D.* *Purified Storax.*

Dissolve the storax in rectified spirit of wine, and strain the solution; afterwards reduce it to a proper thickness with a gentle heat.

Storax is a balsam or combination of resin and benzoic acid, both of which are soluble in alcohol, and neither of them volatile in the heat necessary for evaporating alcohol. The process for purifying it is, therefore, not liable to any chemical objections.

SUCCINUM. *A. E. L. D.* *Amber.*

This is a solid, brittle, bituminous substance, dug out of the earth, or found upon the sea-shores; the largest quantities are met with along the coasts of Polish Prussia and Pomerania. It is of a white yellow, or brown colour, sometimes opaque, and sometimes very clear and transparent.

It emits an agreeable smell when heated or rubbed. By friction it becomes electric; and when heated it softens, swells, and then melts and burns with a greenish or bluish flame, leaving a coaly residuum. By distillation it affords a little acetic acid, an essential oil, and a peculiar acid, named from it the succinic. It is not acted upon by water, or diluted acids. It is imperfectly dissolved in alcohol and ether. Hoffmann dissolved it in oil of almonds in Papin's digester, and in a boiling solution of potass. Dr. Thompson lately discovered that it was soluble in the cold, even in a very weak solution of the sub-carbonat of potass. Heyer ascertained that it was soluble with decomposition in nitrous acid. In attempting to form succinic acid by the action of nitrous acid on amber, Dr. Duncan made the same observation. The acid when heated to ebullition acts violently, copious red fumes are emitted, and the amber is first as if melted, and then dissolved. On cooling, part of the amber separates. The acid solution is decomposed by water, and by alkaline solutions. Amber is rendered soluble in the fixed and volatile oils by melting or roasting it, or by the addition of a little camphor.

It is only kept for the empyreumatic oil and acid obtained from it.

The American Pharmacopœia, although it admits the succinum into its lists, does not mention what preparation of it is to be employed. Certainly it is not meant that the substance itself enters into any medicinal preparation. The oil of amber is noticed in their list of preparations.

OLEUM SUCCINI ET ACIDUM SUCCINI. *A. E. L. D.*

Oil of Amber and Succinic Acid.

Take of

Amber, reduced to powder, and of pure sand, equal parts.

Mix them, and put them into a glass retort, of which the mixture may fill one half: then adapt a large receiver, and distil in a sand bath, with a fire gradually increased. At first, a watery liquor will come over, with some yellow oil; then a yellow oil, with an acid salt; and lastly, a reddish and dark coloured oil.

Pour the liquor out of the receiver, and separate the oil from the water. Press the salt collected from the neck of the retort and sides of the receiver, between folds of blotting paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystallization.

We are not acquainted with any experiments which determine whether the succinic acid exists as such in the amber, or whether it be a product of the decomposition of the amber by the action of heat, for in the process employed for obtaining succinic acid, the amber is completely decomposed.

The sand is added to prevent the amber from running together into masses, and impeding the distillation; but as it renders the residuum unfit for the use of the varnisher, it is not advisable. According to Göttling, this distillation should be performed in a tubulated iron or earthen-ware retort, exposed to the immediate action of the fire, for he says, that, in a sand bath, we cannot regulate the heat sufficiently, and that a glass retort is incapable of supporting the necessary temperature.

Besides the succinic acid collected from the neck of the retort, and sides of the receiver, the oil washes down a portion of it into the receiver, and the watery liquor which comes over is saturated with it. But the whole of it may be obtained by agitating the oil with some boiling water, which will dissolve the acid. This solution is then to be added to the acid liquor, and the acid they contain is easily obtained by evaporation and crystallization. The acid may afterwards be purified by solution in boiling water and crystallization, according to the direction of the colleges.

But even after repeated solutions and crystallizations, a portion of empyreumatic oil still adheres to the acid, and renders it impure. Other methods of purifying it have been therefore attempted. Demachy saturated it with lime, separated the lime by sulphuric acid, and sublimed the succinic acid: Richter saturated succinic acid with potass, decomposed the salt formed with acetat of lead, and disengaged the succinic acid from the lead by means of diluted sulphuric acid: lastly, Morveau asserts, that he obtained it in a state of perfect purity, by treating it with nitrous acid. It is often adulterated with muriat of ammonia, sulphuric acid, sulphat of potass, sugar, &c. When pure it is entirely volatile, gives out no ammoniacal

fumes when triturated with potass, is not precipitated by solutions of baryta, and is soluble in alcohol.

Succinic acid, although retained in our pharmacopœias, is never used in medicine.

Succinic acid crystallizes in transparent white triangular prisms; may be melted and sublimed, but suffers partial decomposition; more soluble in hot than in cold water; soluble in hot alcohol.

Succinats little known. That of ammonia is employed as a test of iron.

PULPARUM EXTRACTIO. *E. L. D.* *Extraction of Pulps.*

Boil unripe pulpy fruits, and ripe ones if they be dry, in a small quantity of water until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey in an earthen vessel, over a gentle fire; taking care to keep stirring the matter continually.

(The pulp of cassia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be pressed out through the sieve, without any previous boiling.)

When these fruits are not sufficiently juicy to afford a pulp by simple expression, the decoction ordered by the Edinburgh and Dublin Colleges is much more certain, and in every respect, preferable to exposing them to a moist air, which is not only often inefficacious, but is apt to render them spoiled and mouldy. On the other hand, the precaution used by the London College, of finishing the evaporation in a water bath, is highly proper, as otherwise they are extremely apt to become empyreumatic.

The pulps expressed from recent substances without coction, are less mucilaginous, are more apt to allow their fluid parts to separate when left at rest, than when they have been previously boiled: and very succulent vegetables, such as apples, pears, and lily roots, may be roasted in hot ashes instead of being boiled.

SULPHAS.—*SULPHAT.*

Sulphat is a generic term for the combination of sulphuric acid with the alkalies, earths, and metallic oxyds. Like the other genera, they may be divided into three families.

Family 1. Alkaline sulphats.—These form no precipitate with alkaline carbonats.

Family 2. Earthy sulphats.—These are either insoluble in water, or, if soluble, form a white precipitate with alkaline carbonats.

Family 3. Metalline sulphats.—These form precipitates, which are often coloured, with alkaline carbonats in general, with prussiat of potass and iron, and with gallic acid.

The *sulphats* form sulphurets when heated to redness with charcoal, and furnish copious precipitates with solutions of baryta.

ALUMEN. *A. E. L. D.* *Alum.*

SULPHAS ALUMINÆ ET POTASSÆ.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ.

SUPER-SULPHAS ARGILLÆ ALKALIZATÆ.

Super-Sulphat (Sulphat) of Alumina and Potass.

Alum is obtained principally from schistose clays, which contain iron pyrites, by roasting, exposure, lixiviation, the addition of a proportion of potass ley, evaporation, and crystallization.

The roasting destroys the bituminous matters these clays commonly contain, the exposure to the air acidifies the sulphur of the pyrites, and the addition of alkali is absolutely necessary for the constitution of alum, which is a triple salt, with excess of acid, consisting of sulphuric acid, alumina, and potass, or ammonia, or a mixture of both. The properties of alum do not seem to be affected by the nature of the alkali. To save the trouble of evaporation, Mr. Curadau has given another method of manufacturing this substance. He takes 100 parts of clay, and 5 parts of muriat of soda, dissolved in as much water as is necessary to form the whole into a paste, which is made into cakes, and baked for two hours in a reverberatory furnace. The mass is then reduced to powder, and put into a good cask; a quarter of its weight of sulphuric acid is then added to it at several times, stirring it well each time. After the vapours of the muriatic acid are disengaged, an equal quantity of water with the acid is added. The mixture then becomes hot, swells, and emits very abundant vapours. When the heat is somewhat moderated, more water must be added until there is about eight or ten times as much as of the acid. The liquor is then drawn off into leaden vessels, and an equal quantity of water poured upon the residuum, which is also drawn off and added to the former. To these is lastly added a solution containing as much potass as is equal to a fourth part, or sulphat of potass equal to one half the weight of the acid. As the liquor cools, it affords crystallized alum, equal in weight to three times the acid, and which may be further purified by re-dissolving it in the smallest possible quantity of boiling water, and allowing it to crystallize.

Alum crystallizes in regular octohedrons, whose sides are equilateral triangles. It has a sweetish but very astringent taste. It is soluble in 15 times its weight of water at 60°, and three-fourths of its weight at 212°. It reddens vegetable blues. It effloresces slightly in the air. By the action of heat it first undergoes the watery fusion,

then loses its water of crystallization, and lastly great part of its acid. It is decomposed by baryta, potass, soda, strontia, and all salts of which these are the bases; by the nitrat, muriat, phosphat, carbonat, borat, and fluat of ammonia; by the nitrat, muriat, phosphat, and carbonat of magnesia; and by the nitrat, muriat, and carbonat of lime. It is also decomposed by the gallic acid, by colouring matters, and by many animal and vegetable substances.

It commonly consists, according to Vauquelin, of 49 sulphat of alumina, 7 sulphat of potass, and 44 water.

Medical use.—Alum is a powerful astringent: it is reckoned particularly serviceable for restraining hemorrhages, and immoderate secretions from the blood; but less proper in intestinal fluxes. In violent hemorrhages, it may be given in doses of fifteen or twenty grains, and repeated every hour or half hour till the bleeding abates: in other cases, smaller doses are more advisable; large ones being apt to nauseate the stomach, and occasion violent constipations of the bowels. It is used also externally, in astringent and repellent lotions and collyria. Burnt alum taken internally, has been highly extolled in cases of colic. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain.

ALUMEN EXSICCATUM. *A. E. L.* Alumen Ustum. *D.*

Dried Alum. Burnt Alum.

Take of
Alum, any quantity.
Melt it in an earthen or iron vessel over the fire, and remove it when it ceases to boil.

Mr. Chaptal found, that by exsiccation in a red heat, alum of his own manufacture lost 0.67; Roman alum 0.50; English alum 0.47; and Levant alum only 0.40. These differences arise principally from different proportions of water of crystallization, but also from an excess of alumina, which the last contains.

According to Kirwan, crystallized alum consists of 17.66 acid, 12 alumina, and 70.24 water, and alum desiccated at 700° of 36.25 acid, and 63.75 basis, by which it would appear that at that heat it loses not only all its water, but also more than half its acid.

Dried alum is only applied externally as a gentle escharotic to fungous ulcers.

SULPHUR. *A. L.*

Sulphur. Brimstone. Roll Sulphur.

Sulphur is a crystallizable solid, of a yellow colour; little sensible taste; peculiar smell when rubbed or heated; specific gravity 1.99; brittle; electric; fusible at 226°; burning with a pale blue

flame at 302°; and with a bright white flame at 570°; and capable of combining with different proportions of oxygen. It is found pure in the vicinity of volcanoes, and exists in many minerals, and in animal substances. *Officinal.*

Oxyd of sulphur is said by Dr. Thomson to be of a dark violet colour, and an austere taste, fracture fibrous, specific gravity 2.325; consistence tough. It contains nearly 7 *per cent.* of oxygen. It is formed on the surface of melted sulphur. Dr. Irvine and Sir H. Davy think this substance contains no oxygen, and differs only in arrangement of particles.

Hydrosulphuric acid is also composed of sulphur and oxygen. It is a dense liquid; specific gravity 1.85; slightly viscid; transparent and colourless; without smell; of a strong acid taste. It freezes at —36°, and boils at 590°. It has a strong attraction for water, absorbing it rapidly from the atmosphere, and producing considerable heat when mixed with it. It is decomposed by most inflammable substances. It does not oxydize gold, platinum, tungsten, or titanium. It decomposes the alkaline and earthy sulphurets, and reduces all organic substances to charcoal. In medicine it is a powerful refrigerant and antiseptic. It consists of 30 sulphur, 45 oxygen, and 17 of water. What was called Glacial sulphuric acid, consists, according to Sir H. Davy, of four volumes of sulphurous acid gas, and three of nitrous acid gas, probably in two or three proportions, with a single proportion of water.

Chloride of sulphur was first formed by Dr. Thomson, who called it *sulphureted muriatic acid.* It is a fluid, appearing red by reflected, and yellowish-green by transmitted light. Sp. gr. 1.6. It smokes in the air, has the smell of sea-weed, and affects the eyes like peat smoke. It does not redden perfectly dry litmus paper, but is decomposed by water. It consists, according to Davy, of one proportion of sulphur, and two of chlorine.

Sulphureted hydrogen gas consists of one sulphur, and two hydrogen; 100 inches weigh 36 or 37 grains, or its specific gravity to hydrogen is 16. It has the odour of rotten eggs; is not respirable; burns with oxygen gas without exploding, and deposites sulphur; an equal volume is absorbed by water, and is the mode in which sulphur exists in mineral waters; reddens vegetable blues; and in its affinities, and the crystallizability of its compounds, it resembles the acids.

There are three distinct combinations of sulphur and its compounds with alkalies and earths. The first consist simply of sulphur, united with an alkaline or earthy base, and are properly called *sulphurets.* The second are composed of sulphureted hydrogen, united with a base, and are called *hydro-sulphurets* or hydro-sulphats. The third contains super-sulphureted hydrogen, attached to a base, and constitute *hydrogureted sulphurets.*

SULPHUR SUBLIMATUM LOTUM. *A. E. D.*

Sulphur Lotum. *L.* Flores Sulphuris Loti.

Washed Sublimed Sulphur.

Take of
Sublimed sulphur, . . . one pound;
Water, ... four pounds.
Boil the sulphur for a little in the water, then pour off this water, and wash away all the acid by affusions of cold water; and lastly, dry the sulphur.

As it is impossible to sublime sulphur in vessels perfectly void of air, a small portion of it is always acidified and converted into sulphurous or sulphuric acid. The presence of acid in sulphur, is always to be considered as an impurity, and must be removed by careful ablution. When thoroughly washed, sublimed sulphur is not acted upon by the atmosphere; there is, therefore, no particular reason for preserving it from the action of the air; for if, on keeping, it becomes moist, it is because the sulphuric acid has not been entirely washed away.

In the neighbourhood of volcanoes it is sometimes found perfectly pure and crystallized; but all the sulphur of commerce is extracted from pyrites by sublimation. It is usually brought to us in large irregular masses, which are afterwards melted and cast into cylindrical rolls, with the addition of some coarse resin, flour, or the like; whence the paler colour of the rolls.

Sulphur should be chosen of a bright yellow colour, should be very inflammable, and should burn with a bright pure blue flame. Sublimed sulphur is never prepared by the apothecary. It has the form of a very fine powder, having a beautiful yellow colour. It often is contaminated with a little sulphuric acid, formed during the process, from which it is easily freed by washing.

Medical use.—Pure sulphur loosens the belly, and promotes insensible perspiration: it seems to pass through the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphurous smell of persons who have taken it, and from silver being stained in their pockets of a blackish colour, which is the known effect of sulphurous fumes. It is a celebrated remedy against cutaneous diseases, both given internally, and externally applied. It has likewise been recommended in coughs, asthmas, and other disorders of the breast and lungs; and particularly in catarrhs of the chronic kind. But it is probable, that the benefit derived from it in these cases, is principally, if not entirely, to be attributed to its operation as a gentle laxative. And with this intention it is frequently used with great advantage in hemorrhoidal affections, and many other diseases in which it is proper to keep the belly gently open.

Sulphur Precipitatum. *L.*

Precipitated Sulphur. Lac Sulphuris.

Take of
Sublimed sulphur, . . . one pound;
Fresh lime, ... two pounds;
Water, ... four gallons.

Boil the sulphur and lime together in the water, then filter the liquor through paper, and drop into it as much muriatic acid as may be necessary to precipitate the sulphur. Lastly, wash this repeatedly with water, till it becomes insipid.

Precipitated sulphur does not differ from well-washed sublimed sulphur, except in being much dearer. Its paler colour is owing to its more minute division, or according to Dr. Thomson, to the presence of a little water; but from either circumstance it derives no superiority to compensate for the disagreeableness of its preparation.

ACIDUM SULPHURICUM. *A. E. L. D.*

Acidum Vitriolicum. Oleum Vitrioli.

Sulphuric Acid. Vitriolic Acid. Oil of Vitriol.

The London and Edinburgh colleges direct, that in the shops, its specific gravity should be to that of water, as 1850 to 1000; the Dublin college, as 1845 to 1000. This want of uniformity is to be regretted.

Sulphuric acid is composed of sulphur and oxygen. It may be obtained in a crystallized or glacial form, but generally exists as a dense liquid; specific gravity 1.85; slightly viscid; transparent and colourless; without smell; of a strong acid taste. At —36° it freezes; it boils at 590°. It has a strong attraction for water, absorbing it rapidly from the atmosphere, and producing considerable heat when mixed with it. It is decomposed by most inflammable substances. It does not oxydize gold, platinum, tungsten, or titanium. It decomposes the alkaline and earthy sulphurets, and reduces all organic substances to charcoal. In medicine, it is a powerful refrigerant, and antiseptic. It contains 56 sulphur, and 44 oxygen.

The *Sulphats* form sulphurets, when heated to redness with charcoal; and furnish copious precipitates with solutions of baryta.

Sulphurous acid gas is colourless, incapable of maintaining combustion, and deleterious when respired. It has a strong, suffocating odour; its specific gravity is 0.00246, or 0.00251. Water at 54° rapidly absorbs one-fourth of its weight of this gas, and when saturated, acquires the specific gravity of 1.040. It is again expelled from it by heat, but not by freezing. It is also absorbed by sulphuric acid, to which it imparts the property of crystallizing, forming

what is called glacial sulphuric acid; oils and ether. When water is present, it is converted by oxygen gas into sulphuric acid. It is decomposed by hydrogen, carbon, and sulphureted hydrogen gas, when assisted by heat. It oxydizes iron, zinc, and manganese. It consists of 85 sulphur, and 15 oxygen.

The *sulphites*, by the action of heat, furnish sulphur, and become sulphats. They are also converted into sulphats, with effervescence, and exhalation of sulphurous vapours, by the sulphuric, nitric, muriatic, and other acids, and gradually, by exposure to the atmosphere when dry, and very quickly when dissolved.

As sulphuric acid is prepared by the trading chemist, it is inserted among the materia medica. It is obtained in two ways, by distilling off the acid from sulphat of iron, previously deprived of its water of crystallization by heat, or by burning sulphur in large leaden chambers, with an eighth part of nitrat of potass to supply, as is very inaccurately supposed, the necessary oxygen. In the first way the strongest acid is obtained, but it is apt to contain iron or copper. By the second process, it generally contains lead, which is easily detected by mixing a portion of the acid with three parts of distilled water, and if the acid be impure, a deposition will be formed. It may be rendered perfectly pure by distillation, filling a retort half full of the common acid, and distilling in a sand-bath, gradually heated as long as any acid comes over. The receiver should not be luted on.

Sulphuric acid powerfully decomposes dead animal matter. It becomes diluted with water formed by the union of the hydrogen and oxygen; another portion of the hydrogen combines with the azote to form ammonia, and the carbon is separated in the state of charcoal. The affinities which regulate this action, are so powerful, that it produces the same effects on the living solids, and therefore it acts upon them as a corrosive. But to its employment with this view, its fluidity is an objection, as it cannot be easily managed.

Medical use.—When sufficiently diluted, it is an excellent tonic, checking fermentation, exciting appetite, promoting digestion, and quenching thirst, and it is therefore used with success in morbid acidity, weakness, and relaxation of the stomach. As an astringent, it is used in hemorrhages; and from its refrigerant and antiseptic properties, it is a valuable medicine in many febrile diseases, especially those called putrid. If taken in any considerable quantity, or for some time, it seems to pass off undecomposed by the kidneys or skin; and it is, perhaps, by its stimulant action on the latter, that it is advantageously employed internally in psora, and other cutaneous affections. The best mode of prescribing it, is to order the quantity of acid to be used, and to direct it to be mixed with as much water as will render it palatable, to which some syrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose.

Externally, it is used as a gargle, particularly in putrid sore throats,

and in aphthous mouths, and as a wash in cutaneous eruptions, and ill-conditioned ulcers. Made into an ointment with sixteen times its weight of axunge, it has been used to cure psora.

ACIDUM SULPHURICUM DILUTUM. *A. E. D. L.*

Diluted Sulphuric Acid.

Take of
Sulphuric acid, . . . one fluid ounce;
Water, ... seven fluid ounces.
Mix them gradually.

The most simple form in which sulphuric acid can be advantageously employed internally, is that in which it is merely diluted with water: and it is highly proper that there should be some fixed standard, in which the acid in this state should be kept. It is, however, much to be regretted, that the same standard with respect to strength, has not been uniformly adopted; and especially, that the London college should have deviated so very remarkably, both from their own former editions, and from the other colleges. In the Edinburgh and Dublin Pharmacopœias, the strong acid is one-eighth by weight of the mixture, which gives one drachm in the ounce, which has at least the merit of convenience. Dr. Powell, whose translation may be considered as official, states, in defence of the change, that the new mixture will be more conveniently made, and that its proportionate dose is easily administered, especially as minute attention thereto, is not of any great practical importance. An ounce of sulphuric acid, by measure, is equal to 14 drachms and eight-tenths of a grain. The comparative strengths of equal bulks, and of equal weights, of the diluted acids in the different Pharmacopœias, are nearly in the following proportions:

	Bulks.	Weights.	Sp. gr.
Former London,	1000	1000	1.070
Dublin, - -		1118	1.090
Edinburgh, - -		1125	
New London, -	1480	1445	1.111 Ph.

Dr. Powell says, that one ounce of the last will saturate about 107 grains of dried subcarbonat of soda, which is confirmed by Mr. Phillips. The dilution by means of distilled water, is preferable to spring water; which, even in its purest state, is not free from impregnations affecting the acid. Even when distilled water is used, there is often a small quantity of a white precipitate, arising from lead dissolved in the acid.

Sulphuric acid has a very strong attraction for water: and their bulk, when combined, is less than that of the water and acid separately. At the same time, there is a very considerable increase of temperature produced, which is apt to crack glass vessels, unless

the combination be very cautiously made; and, for the same reason, the acid must be poured into the water, not the water into the acid. Sulphuric acid, according to Powell, diluted with an equal measure of water, and allowed to cool, rose 21° on the addition of another measure, and 7° after cooling again on the addition of a third.

Table of the Quantity of Real Acid in 100 *parts of Liquid Sulphuric Acid, at the temperature* 60°. *Dalton.*

Atoms. Acid. Water.	Acid per cent. by weight.	Acid per cent. by measure.	Specific gravity.	Boiling point.
1 + 0	100	unknown.	unknown.	
1 + 1	81	150	1.850	620°
	80	148	1.849	605
	79	146	1.848	590
	78	144	1.847	575
	77	142	1.845	560
	76	140	1.842	545
	75	138	1.838	530
	74	135	1.833	515
	73	133	1.827	501
	72	131	1.819	487
	71	129	1.810	473
	70	126	1.801	460
	69	124	1.791	447
1 + 2	68	121	1.780	435
	67	118	1.769	422
	66	116	1.757	410
	65	113	1.744	400
	64	111	1.730	391
	63	108	1.715	382
	62	105	1.699	374
	61	103	1.684	367
	60	100	1.670	360
1 + 3	58.6	97.	1.650	350
	50	76	1.520	290
	40	56	1.408	260
1 + 10	30	39	1.30 +	240
1 + 17	20	24	1.200	224
1 + 38	10	11	1.10	218

Swietenia Mahagoni. *E. Mahogany Tree. The Bark.*

This majestic tree grows principally in Jamaica and in Spanish America. Its useful wood is universally known. Its bark is brown, rough and scaly; on the branches, grey and smoother. Its taste is very astringent, and bitterer than that of Peruvian bark. Its smell weak and aromatic. In its properties and action on the living body, it coincides with Peruvian bark, and may be substituted for it in many situations.

Swietenia Febrifuga. *D. Febrifuge Swietenia. The Bark.*

This species, which in many respects resembles the former, is a native of the East Indies. Its bark is red, brittle, and compact, and covered with a rough, grey cuticle. In its properties it agrees with the mahogany bark, and forms a very valuable substitute for Peruvian bark in the East Indies, where this last is so dear and scarce, and the diseases in which it is indicated so common. It is, however, merely an astringent bitter, and contains no cinchonin. Dr. Roxburgh sent from India a quantity of the extract of this bark, which could not be distinguished from the kino of the shops.

SYRUPI. *A. L. D. E.—SYRUPS.*

In making syrups, where neither the weight of sugar, nor the manner in which it should be dissolved, are directed, the following rule is to be followed.

Take of
Double refined sugar, in powder, . . . twenty-nine ounces;
The liquor prescribed, ... one pint.
Gradually add the sugar, and digest with frequent agitation in a close vessel, and in a moderate heat, until it be dissolved; then set it aside for twenty-four hours, take off the scum, and pour off the syrup from the fæces, if there be any.
Syrups are to be kept in a place, whose temperature never exceeds 50° Fah.

Syrups are solutions of sugar in any watery fluid, whether simple or medicated. Simple syrup is nutritious and demulcent. When made of fine sugar, it is transparent and colourless. If necessary, it is easily clarified, by beating to a froth the white of an egg with three or four ounces of water, mixing it with the syrup, and boiling

the mixture for a few seconds, until the albumen coagulates, and enveloping all heterogeneous matters, it forms a scum, which may be easily taken off, or separated by filtration. When, instead of simple water, any other fluid is used for dissolving the sugar, the syrup is then medicated. Medicated syrups are prepared, either with expressed juices, infusions, decoctions, or saline fluids. The object of forming these into syrups, is either to render them agreeable to the palate, or to preserve them from fermentation. In the latter case, the quantity of sugar added becomes a matter of great importance; for, if too much be employed, the sugar will separate by crystallization, and if too little, instead of preventing fermentation, it will accelerate it. About two parts of sugar to one of fluid, are the proportions directed by the British colleges with this view. But, as in some instances, a larger quantity of fluid is added, and afterwards reduced to the proper quantity by decoction, it will not be superfluous to point out some circumstances, which show the evaporation to have been carried far enough. These are the tendency to form a pellicle on its surface, when a drop of it is allowed to cool, the receding of the last portion of each drop, when poured out drop by drop, after it is cold, and, what is most to be relied on, its specific gravity when boiling hot, being about 1.385, or 1.3, when cold. The syrup which remains, after all the crystallizable sugar has been separated from it, has been much, and probably justly, recommended by some, for the preparation of medicated syrups and electuaries, although its pharmaceutical superiority is actually owing to its impurity.

SYRUPUS SIMPLEX. *A. E. L.* *Simple Syrup.*

Take of
  Sugar, in powder, ... fifteen ounces;
  Water, ... half a pint.
Let the sugar be dissolved by a gentle heat in the water, and boiled a little, so as to form a syrup, the scum being removed.

This preparation is a plain liquid sweet, void of flavour or colour; and is more convenient in extemporaneous prescription, than sugar undissolved.

SYRUPUS ACETI. *A. E.* *Syrup of Vinegar.*

Take of
  Purified vinegar, . . . two pints and a half;
  Sugar, ... three pounds and a half.
Boil them to form a syrup.

This is to be considered as simple syrup merely acidulated, and is by no means unpleasant. It is often employed in mucilaginous mixtures, and the like: and, on account of its cheapness, it is often preferred to syrup of lemons.

SYRUPUS ALLII. *A. D.* *Syrup of Garlic.*

Take of
Garlic, sliced, . . . one pound;
Boiling water, . . . two pints.
Macerate the garlic in the water, in a covered vessel, for twelve hours; then add two parts of sugar, to one part of the strained liquor, and form a syrup.

This is a very disagreeable syrup; but when we wish to extract the virtues of garlic by a watery menstruum, it is the best means we can employ.

SYRUPUS AURANTII CORTICIS. *A.* *Syrup of Orange Peel.*

Syrupus Citri Aurantii. *E.* Syrupus Aurantii. *D.*

Syrupus Aurantionum. *L.* *Orange Syrup.*

Take of
The fresh outer rind of Seville oranges, . . three ounces;
Boiling water, ... one pound and an half;
Refined sugar, ... two pounds.
Macerate the rind in the water for twelve hours; then add to the filtered liquor the sugar, in powder, and apply a gentle heat, so as to form a syrup.

In making this syrup, it is particularly necessary that the sugar be previously powdered, and dissolved in the infusion with as gentle a heat as possible, to prevent the exhalation of the volatile parts of the peel. With these cautions, the syrup proves a very elegant and agreeable one, possessing a great share of the fine flavour of the orange-peel.

The American Pharmacopœia directs the laceration of the oil vesicles under water with a grater. This seems an undue refinement of the process, and certainly an unnecessary addition to the labour.

Syrupus Citri Medici. *E.* Syrupus (Limonis. *D.*) Limonum. *L.*

Syrup of Lemons.

Take of
Juice of lemons, strained, . . . three parts;
Sugar, ... five parts.
Dissolve the sugar in the juice so as to make a syrup.

SYRUPUS MORI. *L.* *Syrup of Mulberry.*

Take of
- Mulberry juice strained, . . . one pint;
- Refined sugar, ... two pounds.

Dissolve the sugar in the mulberry juice, as directed for syrup.

In the same way are prepared,

Syrupus	*Syrup of*
Succi Rubi Idæi. L.	*Raspberry-juice.*
Ribis Nigri. L.	*Black Currant-juice.*

All these are very pleasant cooling syrups; and with this intention they are occasionally used in draughts and juleps, for quenching thirst, abating heat, &c. in bilious or inflammatory distempers. They are sometimes likewise employed in gargarisms for inflammations of the mouth and tonsils.

SYRUPUS COLCHICI. *A.* Syrupus Colchici Autumnalis. *E.*

Syrup of Colchicum or Meadow Saffron.

Take of
- Fresh meadow saffron, cut in slices, . . . one ounce;
- Purified vinegar, ... one pint;
- Sugar, ... twenty-six ounces.

Macerate the meadow saffron in the vinegar for two days, occasionally shaking the vessel; then strain the infusion with gentle expression. To the strained infusion add the sugar; and boil a little so as to form a syrup.

This syrup seems to be the best preparation of the colchicum. We must take care to gather this root in the proper season: and from errors in this particular we are to ascribe the uncertainty in the effects of this medicine as found in the shops.

The syrup of colchicum is often successfully employed as a diuretic, and may be taken from a drachm or two to the extent of an ounce or more.

Syrupus Althææ. *L.* (Officinalis. *E.*) *Syrup of Marshmallow.*

Take of
- Fresh marshmallow roots, sliced, . . . one pound;
- Water, ... ten pounds;
- Refined sugar, ... four pounds.

Boil the water with the roots to the consumption of one half, and strain the liquor, strongly expressing it. Suffer the strained liquor to rest till the feces have subsided; and to the depurated liquor add the sugar; then boil so as to make a syrup.

This is merely a mucilaginous syrup, and is chiefly used in nephritic cases, for sweetening emollient decoctions, and the like.

Syrupus Dianthi Caryophylli. *E.*

Syrupus Caryophylli Rubri. *D.* *Syrup of Clove July-flower.*

Take of
Clove July-flowers, fresh gathered and freed from the heels, one pound;
Refined sugar, ... seven pounds;
Boiling water, ... four pounds.
Macerate the petals in the water for twelve hours; then to the strained liquor add the sugar previously beat, and dissolve it by a gentle heat, so as to form a syrup.

As the beauty of the colour is a principal quality in this syrup, no force in the way of expression should be used in separating the liquor from the flowers.

Some have substituted to it one easily prepared at seasons when the flowers are not to be procured: an ounce of clove spice is infused for some days in twelve ounces of white wine, the liquor strained, and, with the addition of twenty ounces of sugar, boiled to a proper consistence: a little cochineal renders the colour of this syrup exactly similar to that prepared from the Clove July-flowers; and its flavour is of the same kind, though not so pleasant. The counterfeit may be readily detected by adding to a little of the syrup some alkaline salt or ley, which will change the genuine syrup to a green colour; but in the counterfeit it will make no such alteration, only varying the shade of the red.

Syrupus Croci. *L.* *Syrup of Saffron.*

Take of
Saffron, ... one ounce;
Refined sugar, . . . two pounds and a half;
Boiling water, . . . one pint.
Macerate the saffron, in the water, for twelve hours, in a close vessel; and dissolve the sugar in the strained liquor, that it may be made a syrup.

Saffron is very well fitted for making a syrup, as in this form a sufficient dose of it is contained in a reasonable compass. This syrup is a pleasant cordial, and gives a fine colour to juleps.

SYRUPUS RHAMNI. *A. L.* *Syrup of Buckthorn.*

Take of
The juice of ripe buckthorn berries, depurated, . . . two parts;
Refined sugar, ... one part.
Boil them so as to form a syrup.

This preparation, in doses of three or four spoonsful, operates as a brisk cathartic. The principal inconveniences attending it are, its

being very unpleasant, and occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes: these effects may be prevented by drinking liberally of water-gruel, or other warm liquids, during the operation.

SYRUPUS RHŒI. *A.* *Syrup of Rhubarb.*

Take of
- Rhubarb, bruised, . . . two ounces;
- Boiling water, ... one pint.

Macerate for twenty-four hours; strain, and add two parts of sugar to one of the liquor; then boil to form a syrup.

SYRUPUS RHŒI AROMATICUS. *A.*

Aromatic Syrup of Rhubarb. Spiced Rhubarb.

Take of
- Rhubarb, bruised, . . . five drachms;
- Cloves,
- Cinnamon, each, . . . half an ounce;
- Nutmegs, ... two in number;
- Water, ... one pint.

Digest and evaporate till the liquor is reduced to half a pint; strain, and add one pound of sugar, and half a pint of diluted alcohol; then boil a little to form a syrup.

SYRUPUS RHŒI CUM SENNA. *A.*

Syrup of Rhubarb with Senna.

Take of
- Rhubarb, bruised,
- Senna, each, . . . one ounce and a half;
- Cardamom, ... three drachms;
- Boiling water, . . one pint.

Digest for twenty-four hours, and evaporate with a gentle heat till the liquor is reduced to half a pint; then strain and add one pound of sugar; lastly boil to form a syrup.

SYRUPUS SARSAPARILLÆ. *A.* *Syrup of Sarsaparilla.*

Take of
- Sarsaparilla, sliced, . . . two pounds;
- Liquorice, sliced,
- Roses,
- Senna,
- Anise, each, ... two ounces;
- Warm water, ... twelve pints.

Infuse the sarsaparilla in the water for twenty-four hours; then boil for a quarter of an hour, and strain by strong compression; boil the sarsaparilla again in ten pints of water to the consumption of one half of the liquor; strain, mix the two liquors, and add the other ingredients. Boil again to the consumption of one half of the liquor; strain, and add of

Honey,
Sugar, each, two pounds.

Boil to form a thick syrup.

SYRUPUS SARSAPARILLÆ ET GUAIACI. *A.*

Syrup of Sarsaparilla and Guaiacum.

Take of
Sarsaparilla, sliced,
Guaiacum, rasped, of each, . . . one pound;
Roses,
Acacia gum,
Senna, each, ... one ounce;
Ginger, ... half an ounce;
Water, ... ten pints.

Boil the two first ingredients in the water for one hour, strain, and to the residuum add ten pints more of water; boil for two hours, and, towards the end of the boiling, add the other ingredients; strain, and to the decoctions, add of clarified honey and sugar, each three pounds; and boil to form a syrup.

SYRUPUS SCILLÆ. *A.* SYRUPUS SCILLÆ MARITIMÆ. *E.*

Syrup of Squills.

Take of
Vinegar of squills, ... two pounds;
Refined sugar, in powder, . . . three pounds and a half.

Dissolve the sugar with a gentle heat, so as to form a syrup.

This syrup is used chiefly in doses of a spoonful or two, for promoting expectoration, which it does very powerfully. It is also given as an emetic to children.

SYRUPUS PAPAVERIS. *L.*

SYRUPUS PAPAVERIS ALBI. *D.* SYRUPUS PAPAVERIS SOMNIFERI. *E.*

Syrup of (White) Poppy.

Take of
White poppy-heads, dried, and freed from the seeds, one part;
Boiling water, ... fifteen parts;
Double refined sugar, . . . two parts.

Macerate the sliced heads in the water for twelve hours; next boil till only one-third part of the liquor remain; then strain it, by expressing it strongly. Boil the strained liquor to the consumption of one-half, and strain again; lastly, add the sugar, and boil a little so as to form a syrup.

This syrup, impregnated with the opiate matter of the poppy-heads, is given to children in doses of two or three drachms; to adults, from half an ounce to an ounce and upwards, for easing pain, procuring rest, and answering the other intentions of mild opiates. Particular care is requisite in its preparations, that it may be always made, as nearly as possible, of the same strength, and accordingly the colleges have been very minute in their description of the process.

Syrupus Opii. *D.* *Syrup of Opium.*

Take of

Watery extract of opium, . . . eighteen grains;
Boiling water, ... eight ounces by measure.

Macerate until the opium be dissolved, then add sugar, so as to make a syrup.

This syrup is an elegant substitute for the former. It is made with infinitely less trouble, and is always of an uniform strength. It contains about two grains and a half of opium in the ounce.

Syrupus Papaveris Erratici. *D.* Syrupus Rhœados. *L.*

Syrup of Red Poppy.

Take of

The fresh petals of the red poppy, . . . one pound;
Boiling water, ... twenty ounces by measure.

Put the flowers, by degrees, into the boiling water. After this, the vessel being removed from the fire, and taken out of the bath, macerate for twelve hours; then press out the liquor, and set it apart, that the feces may subside. Lastly, make it into a syrup, with refined sugar.

The design of putting the flowers into boiling water in a water bath is, that they may be a little scalded, so as to shrink enough to be all immerged in the water; without this precaution they can scarce be all got in: but they are to be continued no longer over the fire than till this effect is produced, lest the liquor become too thick, and the syrup be rendered ropy.

As a medicine it is perfectly insignificant.

Syrupus Rosæ Gallicæ. *E.* *Syrup of Red Roses.*

Take of
The dried petals of red roses, . . . one part;
Refined sugar, ... two parts;
Boiling water, ... three parts.
Macerate the roses in the water for twelve hours, then boil them a little and strain the liquor, add to it the sugar, and boil them again so as to form a syrup.

This syrup is supposed to be mildly astringent; but is principally valued on account of its red colour.

Syrupus Rosæ Centifoliæ. *E.* *Syrup of Damask Roses.*

Syrupus Rosæ. *L.* *Syrup of Roses.*

Take of
The fresh petals of the damask rose, . . . one part;
Boiling water, ... four parts;
Double refined sugar, ... three parts.
Macerate the roses in the water for the night, then to the liquor strained, and freed from the dregs, add the sugar; boil them into a syrup.

This syrup is an agreeable and mild purgative for children in the dose of half a spoonful, or a spoonful. It likewise proves gently laxative to adults; and with this intention may be of service in costive habits.

SYRUPUS SENEGÆ. *A.* *Syrup of Seneca Snake-Root.*

Take of
Seneca snake-root, bruised, . . four ounces;
Water, ... one pint;
Sugar, ... one pound.
Boil the snake-root in the water, to the consumption of the one half, decant the clear liquid, add the sugar, and boil to form a syrup.

SYRUPUS TOLUTANI. *A.*

Syrupus Tolutanus. *L.* Syrupus Toluiferæ Balsami. *E.*

Syrup of (Balsam of) Tolu.

Take of
Common syrup, ... two pounds;
Tincture of balsam of Tolu, . . . one ounce.
With the syrup recently prepared, and when it has almost grown cold, after it has been removed from the fire, gradually mix the tincture with constant agitation.

In the formula of the London College, the benzoic acid of the balsam alone is contained. That of the Edinburgh College contains the whole substance of the balsam in larger quantity. They are both moderately impregnated with the agreeable flavour of the balsam.

A most insignificant article, containing about half a drachm of Tolu, to two pounds of syrup.

Syrupus Violæ. *D.* Syrupus Violæ Odoratæ. *E.*

Syrup of Violets.

Take of
- Fresh violets, ... two parts;
- Boiling water, ... eight parts;
- Refined sugar, ... fifteen parts.

Macerate the violets in the water for twenty-four hours in a glass or glazed earthen vessel, close covered; then strain without expression, and to the strained liquor add the sugar, powdered, and make into a syrup.

This syrup has a very agreeable flavour; and in the quantity of a spoonful or two proves to children gently laxative. It is apt to lose, in keeping, the elegant blue colour, for which it is chiefly valued; and hence some have been induced to counterfeit it with materials whose colour is more permanent, and which are more easily obtained. This abuse may be readily discovered, by adding to a little of the suspected syrup any acid or alkaline liquor. If the syrup be genuine, the acid will change it red, and the alkali green; but if counterfeit, these changes will not happen. From this mutability of the colour of the violet, it forms an excellent test of the presence of acids and alkalies; and it is also obvious, that a prescriber would be deceived if he should expect to give any blue tinge to acidulated or alkalized juleps, or mixtures, by the addition of the blue syrup.

Another equally contemptible appendage to a Pharmacopœia.

Syrupus Sennæ. *L. D.* Syrupus Cassiæ Sennæ. *E.*

Syrup of Senna.

Take of
- Manna,
- Refined sugar, each, . . . one pound;
- Senna, ... half an ounce;
- Boiling water, ... a pint.

Macerate the senna in the water, in a covered vessel, for twelve hours; then, with the strained liquor, mix the manna and the sugar, so that they may be dissolved.

This preparation, which is intended to be an officinal substitute for an excellent nursery purgative, is a proof of the impropriety of

colleges sanctioning prescriptions which they have not brought to the test of experiment. Mr. Phillips found, that the proportions as given by the Dublin College yielded, instead of a fluid syrup, a substance so thick, that it could not even be shaken out of an inverted vessel, owing to the crystallization of the manna. Treacle is the best addition for forming infusion of senna into a syrup, as it has no tendency to crystallize, and covers its taste so completely, that children take it readily.

SYRUPUS ZINGIBERIS. *A. D. L.*

Syrupus Amomi Zingiberis. *E.* *Syrup of Ginger.*

Take of
Ginger, in powder, . . . three ounces;
Boiling water, ... four pounds;
Refined sugar, ... seven pounds and a half.
Macerate the ginger in the water, in a close vessel, for twenty-four hours; strain the infusion, and form a syrup, by adding the sugar.

This is an agreeable and moderately aromatic syrup, impregnated with the flavour and virtues of the ginger.

T.

TAMARINDUS. *A.* Tamarindus Indica. *E. L. D.*

Tamarind.

Tamarind Tree. The preserved Fruit.

This tree grows both in the East and West-Indies. The fruit is a broad ash-coloured pod. The external covering is thin and brittle, and contains several hard seeds, enveloped in a soft brown pulp. Tamarinds are cured in two ways. The common way is to throw hot sugar from the boilers on the ripe pulp; but a better method is to put alternate layers of tamarinds and powdered sugar in a stone jar. By this means the tamarinds preserve their colour and taste more agreeably.

East-India tamarinds are longer than the West-India sort; the former containing six or seven seeds each, the latter rarely above three or four.

Preserved tamarinds should be fresh and juicy, and should have an agreeable acid taste. They should not have a musty smell; the seeds should not be soft and swollen, and the blade of a knife should not get a coating of copper by being immersed amongst them.

Tamarinds contain sugar, mucilage, citric acid, super-tartrat of potass, tartaric acid, and malic acid.

Medical use.—The pulp of these fruits, taken in the quantity of from two or three drachms to an ounce or more, proves gently laxative and purgative; and, at the same time, by its acidity, quenches thirst, and allays immoderate heat. It increases the action of the purgative sweets, cassia and manna, and weakens that of the resinous cathartics.

Salts, whose base is potass, form an improper addition to tamarind, for they are decomposed, and the tartaric acid of the fruit is precipitated in the form of super-tartrat of potass.

TANACETUM. *A.* (*Secondary.*) Tanacetum Vulgare. *D.*

Common Tansy. The Leaves.

Tansy is perennial, and grows wild by road sides and the borders of fields, and is frequently also cultivated in gardens, both for culinary and medicinal uses: it flowers in June and July.

Medical use.—Considered as a medicine, it is a moderately warm bitter, accompanied with a strong, not very disagreeable flavour. Some physicians have had a great opinion of it, in hysteric disorders, particularly those proceeding from a deficiency, or suppression of the uterine purgations. The leaves and seeds have been of considerable esteem as anthelmintics; the seeds are less bitter, and more acrid and aromatic than those of rue, to which they are reckoned similar; or of santonicum, for which they have been frequently substituted. An infusion of tansy, drunk in a manner similar to tea, has been strongly recommended as a preventive of the return of gout.

TAPIOCA. *A.* Iatropha Manihot.

Tapioca. The fecula of the Root

A mild, nutritious demulcent, better adapted to the materia alimentaria than to the materia medica.

TELÆ ARANEARUM. *Spider's Web.*

It would scarcely be supposed that this article would have engaged the attention of physicians, as useful in the Materia Medica: and it may serve to show how little capable we are of estimating the value of any thing in this respect, except by experience and observation. It seems to have been long overlooked, that it was formerly employed, and has lately been again introduced to notice. In Dr. Chapman's Therapeutics will be found all that is principally known upon the subject. And the following notices from different works, contain the principal facts I can collect relative to it.

"The web astringes and conglutinates, and is, therefore, vulnerary; restrains bleeding, and prevents inflammation. The country people have a tradition, that a small quantity of spider's web, given about an hour before the fit of an ague, and repeated immediately before it, is effectual in curing that troublesome, and sometimes obstinate distemper. This remedy is not confined to our own country; for I am well informed that the *Indians* about *North Carolina* have great dependance on this remedy for agues, to which they are much subject; and I am acquainted with a gentleman long resident in those parts, who assures me he was himself cured by it of that distemper. And, indeed, experience confirms the efficacy of this medicine in the cure of agues."—*James's New English Dispensatory, London,* 1747. *p.* 484.

In the Medical and Physical Journal, vol. 21. p. 363, will be found an interesting paper on this subject, by Dr. R. Jackson, in which he states the success of Dr. Gillespie, of Edinburgh, in curing an obstinate intermittent with cobweb, after other means had failed. He was led from this to try it himself, and has given several instances of its perfect efficacy, even when of long continuance; and he is led from those cases "to consider cobweb as possessing the power of suspending the course of intermitting fever with great certainty." And elsewhere he concludes, that it "possessed an extraordinary and altogether an inexplicable power in calming irritations, and in diminishing the excess of bodily torments"—hence he was induced to try it "in the deliria, pains, spasms, and subsultus, common in fevers of the continued class." The effect far exceeded his expectations. He likewise effected perfect cures in some troublesome spasmodic affections; and gave it with the most marked benefit in dry, irritating coughs, usually termed nervous, singly, and sometimes conjoined with opium. In the advanced stage of phthisis, it procured a respite beyond his expectation, one particular case of which he details. He further found it useful in restraining a troublesome hiccough. And he concludes by affirming, "that cobweb diminishes morbid irritability, and calms irritations of both body and mind, in a degree far exceeding any drug or remedy within the circle of our knowledge."

The natural history of the spider and its web, is given in the Monthly Magazine, vol. 20. p. 222. They are also spoken of in

Geoffroy's Materia Medica, vol. 14. p. 230—262. At p. 265, we have an account of this remedy in the following words:

"Quant à l'usage extérieur de l'Araignée on l'estime pour les fièvres intermittentes, et principalement pour la fièvre quarte. On prend pour cela une grosse araignée, qu'on écrase et qu'on applique sur le poignet; ou bien on l'enferme vivante dans une coquille de noix, et on attache cette coquille au col à l'entrée de l'accès: d'autres préfèrent la toile, et en prennent de la grosseur d'un œuf de poule, qu'ils mêlent avec parties égales de suye de cheminée, y ajoûtant un peu de sel-commun, et ce qu'il faut de vinaigre pour faire du tout un cataplasme qu'ils appliquent sur les deux poignets du fébricitant, répétant ce remède deux ou trois fois. Il y en a meme qui en font avaler de la grosseur d'un pois dans un verre de vin blanc au commencement du frisson; ce qui guérit quelquefois en faisant suer abondamment. M. James dans son Dictionnaire Universel de Médecine, rapporte à ce sujet la cure singulière d'une fièvre intermittente par le moyen de la toile d'araignée prise intérieurement. On peut voir dans le traité du savant Docteur Martin Lister sur les Araignées, beaucoup d'autres propriétés qu'il attribue à ces insectes, et les remèdes qu'il en tire pour différentes maladies."

The following quotations are taken from a Thesis, by Dr. Broughton, who graduated in this University, in 1818.

"The fresh web, before it has been long exposed to the action of the sun and atmosphere, is extremely glutinous; and when pressed together by the fingers, or rubbed in a mortar, assumes a black appearance, resembling India rubber in texture and elasticity, which, however, it soon loses, becoming hard and fibrous. If it is allowed to remain for the space of two or three days after it has been spun, it is completely deprived of its glutinous quality, and the fibres cannot be made to adhere, except by the addition of some gummy matter: gum arabic answers this purpose.

"When dried, it is extremely light, of a greyish colour, without taste or smell, and has much the appearance of threads of very fine silk matted together.

"This is by far the most usual appearance, as it is very difficult to collect a sufficient quantity of the fresh webs, each web containing not more than one or two grains; and if not collected previous to the third day after it is spun, it will be deprived of its gluten, and consequently reduced to the dried form."

"*Officinal Preparation.*—With regard to the preparations of the web for medical use, the apothecary is extremely limited; it being insoluble in water, proof spirit, or even the human saliva. It is impossible to prepare it either in form of decoction, infusion, or tincture. In consequence of the gluten of the fresh, and the thread-like structure of the dried web, it is equally difficult to reduce it to powder: the only possible form, therefore, is that of pill, to which it can easily be reduced, when fresh, without the aid of any other article; and when dried, by the addition of starch, bread, or gum arabic; the latter I have found most efficacious, a sufficient quantity of the mucilage being added to form a mass.

"*Species.*—The black spider has been supposed by Dr. R. James to be the most efficacious, and the same opinion has been advanced by Dr. Poyas, of Charleston, South Carolina, (as will be mentioned in the sequel.)

"This opinion, I think, I can safely state *to be incorrect;* and am satisfied that facts and arguments can be produced sufficiently strong to prove the assertion. Upon examination of the webs of the various species of spider, I found them all

in the recent state possessed of the same glutinous quality, and when dried of the same fibrous structure.

"A very peculiar substance appeared necessary for the formation of the web which ensnares flies, &c. for the food of the insect: and that the web of every species was equally calculated for this purpose.

"This fact, therefore, being established, that the webs of every species was the same both in appearance and utility, I am inclined to believe, that like the chyle of the human system, every substance taken into the stomach of the insect, (without regard to species,) produce one homogeneous mass, qualified for every purpose to which the web of any one species may be applied.

"There are also facts corroborating which I shall here proceed to state. Having had some opportunities to try the effect of the web in disease, and finding it difficult to procure the production of any one species, I collected it promiscuously, and was pleased to find it in more than one instance productive of the best effects. Another fact, which I collected from the Encyclopædia, under the head Araneus, is equally important. It is there stated, that "every species of spider changes its colour and size according to age, sex, and season; so that the black spider in one month and the black spider in another, though in appearance the same, may be distinct species."

"In all the cases of disease which I have seen or heard of the exhibition of the web, no sensible, or at least no uniform, operation could be observed. Some patients were sensible of none, others of a slight sudorific, and some a nauseating effect; and one or two thought that it proved cathartic after remaining in the system for the space of twelve or fifteen hours. These accounts being so incorrect and various, I determined to ascertain (if possible) the correct operation, by giving the web to healthy persons. I accordingly chose healthy *adults*, and exhibiting the web, I detained the patients in order carefully to observe any operation that might occur.

"I found from these experiments, that the operation of the web appeared principally to be upon the arterial system; and, perhaps, in less time than any article already known: the force and frequency of the pulse being uniformly reduced, in some cases ten, in others fifteen strokes in a minute; and in one case, the pulse, from being strong and full, became soft, small, and very compressible: all which operation took place within the space of two hours; after which time the artery gradually regained its former force and frequency. This has been the only invariable effect I could observe, all others appearing but anomalous.

"*Dose.*—Dr. Poyas informed me that he gave the web in doses of twenty grains. I think I may state from twelve to twenty grains to an adult, to be both safe and efficacious. The usual time of exhibiting the web is about an hour previous to the attack.

"*Application and efficacy in intermittent fever.*—A gentleman of veracity informed me that he had used the web with the best effect, in the case of a servant of his who had been troubled with an intermittent fever for the space of eighteen months. All the evacuantia usually employed were used, and Peruvian bark in large quantities was inefficacious; at length being informed of the web, he gave one scruple every day before the expected attack, which effected a complete cure in the space of one week.

"A second and a third case occurred, which he treated in the same manner, and with the same success.

"He informed me that Dr. Poyas was the gentleman to whom he was indebted for his information; and being myself acquainted with the Doctor, I wrote, and received the following answer:

"*Dear Sir*—I have to acknowledge the receipt of your letter respecting the spiders' web. It is now near twenty years since I was engaged in the practice of medicine, during which I made use of the web in cases of intermittent fever. After the usual evacuants had been used, and when the bark was inadmissible or ineffectual, I gave it in doses of twenty grains an hour before the expected attack; and think I may say I never knew it fail. I used the web of the black spider, but think that the web of any might answer.

"Your most obedient,

"JOHN E. POYAS."

Dr. Holmes also sends the following information upon the same subject:

"*Dear Sir*—According to your request, I send you an account of *two cases* in which I exhibited the spiders' web. Two negroes had had intermittent fever for three or four weeks, accompanied with violent headach: one of them complained of the pain being more severe during the intermission. Emetics, cathartics, &c. had been given during the paroxysm, and bark during the intermission, but still every evening it returned. Finding the disease still continued, I gave them the spiders' web; to each, three pills containing four grains, were exhibited just before the chill came on, which had the effect of shortening the fit considerably. Five pills, containing four grains, were given to each at the next paroxysm, which had the effect of completely putting a stop to the disease.

"Yours, truly,

"HENRY M. HOLMES."

Dr. Broughton next gives an account of a case:

P. C. attacked with quotidian, 20th July, 1817—resisting the common modes of practice and empirical prescriptions to 31st August, when she began the cobweb pills, three a day, of four grains each: the paroxysms becoming milder, until the 3d of September, when four pills were given, and no return of the disease ensued.

TEUCRIUM MARUM. *D. Syrian herb Mastich. The Herb.*

This is a small, shrubby plant, growing spontaneously in Syria, Candy, and other warm climates, and cultivated with us in gardens. The leaves have an aromatic, bitterish taste; and, when rubbed betwixt the fingers, a quick, pungent smell, like volatile alkali, which soon affects the head, and occasions sneezing: distilled with water, they yield a very acrid, penetrating, essential oil, resembling that of scurvy-grass. These qualities sufficiently point out the uses to which this plant might be applied; at present it is little otherwise employed than in cephalic snuffs.

TEUCRIUM CHAMÆDRYS. *D. Wall Germander. The Herb.*

This perennial herb is found plentifully in the isle of Ely, and near Cambridge. It flowers in July and August. It is an aromatic bitter, and is considered to be tonic and stimulant. An infusion of it is given in ague, chlorosis, and arthritis.

TINCTURÆ.—*TINCTURES.*

Tinctures should be digested in stopped glass bottles, and in a temperature of about 80°, unless otherwise directed. They should be frequently shaken during the preparation.

The term Tincture has often been employed in a very vague sense. It is now commonly applied to solutions, made by digestion, in alcohol, or diluted alcohol. But it is also, though perhaps incorrectly, extended to solutions in ether, ethereal spirits, and spirit of ammonia.

Alcohol is capable of dissolving resins, gum resins, extractive, tannin, sugar, volatile oils, soaps, camphor, adipocere, colouring matters, acids, alkalies, and some compound salts. Many of these, as the gum resins, soaps, extractive, tannin, sugar, and saline substances, are also soluble in water, while water is capable of dissolving substances, such as gum, gelatin, and most of the compound salts, which are insoluble in alcohol. But the insolubility of these substances in the different menstrua is not absolute, but merely relative; for a certain proportion of alcohol may be added to a solution of gum in water, without decomposing it; and a solution of resin in alcohol, will bear a certain admixture of water, without becoming turbid. Therefore, diluted alcohol, which is a mixture of these two menstrua, sometimes extracts the virtues of heterogeneous compounds more completely than either of them separately.

Alcohol is used as a menstruum,

1. When the solvend is not soluble, or sparingly soluble, in water.
2. When a watery solution of the solvend is extremely perishable.
3. When the use of alcohol is indicated, as well as that of the solvend.

In making alcoholic tinctures, we must observe, that the virtues of recent vegetable matters are very imperfectly extracted by spirituous menstrua. They must, therefore, be previously carefully dried, and as we cannot assist the solution by means of heat, we must facilitate it, by reducing the solvend to a state of as minute mechanical division as possible. To prevent loss, the solution is commonly made in a close vessel, and the heat applied must be very gentle, lest it be broken by the expansion of vapour.

The action of tinctures on the living system, is always compounded of the action of the menstruum, and of the matters dissolved in it. Now, these actions may either coincide with, or oppose, each other; and as alcohol is at all times a powerful agent, it is evident that no substance should be exhibited in the form of a tincture, whose action is different from that of alcohol, unless it be capable of operating in so small a dose, that the quantity of alcohol taken along with it is inconsiderable.

Tinctures are not liable to spoil, as it is called, but they must nevertheless, be kept in well closed phials, especially when they contain active ingredients, to prevent the evaporation of the menstruum.

They generally operate in doses so small, that they are rarely exhibited by themselves, but commonly combined with some vehicle. In choosing the latter, we must select some substance which does

not decompose the tincture, or at least separates nothing from it in a palpable form.

The colleges direct all tinctures to be prepared in closed phials; and to be frequently shaken during the process.

Tinctures consist of alcohol, proof spirit, or spirit of greater or less density, holding in solution one or more of those proximate principles of vegetable, or animal matter, which are soluble in that menstruum, viz. *Sugar, resin, extractive, tannin, cinchonin, camphor, volatile oils, morphia, emetin, conein, elatin,* and *several acids.* The proper solvent of those bodies, termed *gum-resins,* appears to be proof spirit. The compilers of the *Codex Medicamentarius* of Paris, have defined the different degrees of spirituous strength requisite for the full and perfect extraction of the active elements of different bodies, with great truth and nicety; thus, they direct for these purposes, a spirit of three different standards, viz. 36, (*specific gravity* .837,) 32, (.856) 22, (.915) of Beaume's hydrometer; with the first are prepared the *resinous* tinctures; with the second, those wherein the *resinous, extractive,* or *gummy* elements, hold nearly an equal place; and with the third, those in which the latter predominate. We are, moreover, indebted to this committee for having set at rest a question which has been long doubtful, whether the addition of alkaline agents increases the extractive powers of the spirit? They have indeed ascertained by experiment, that the reverse not frequently obtains; for instance, they found that a smaller proportion of *guaiacum* was dissolved by the spirit of ammonia, than by alcohol of the same strength, and that the quantity of matter dissolved from the *root of Valerian,* was the same in both cases. Very active substances, soluble in alcohol, are those which are more particularly adapted for tinctures, since they furnish preparations, which are efficient in small doses, and very manageable in extemporaneous prescription, such are the tinctures of *Opium, Digitalis, Hyoscyamus, Scilla, &c.;* and from the chemical analysis of *Elaterium,* there can be no doubt, but that a very active and useful tincture of that substance, might be introduced into practice; on the contrary, substances of little activity, except in large doses, are the least adapted for this form of exhibition, as in such cases, the solvent will act more powerfully on the living system, than the principles which it may hold in solution, and when continued for any length of time, will lay the foundation of the pernicious custom of dram drinking; such tinctures, however, are not without their value in combination; they sometimes increase the efficacy, and often correct the operation, or disguise the flavour of the medicines with which they may be united. The addition of a tincture has likewise the effect of preserving decoctions and infusions from spontaneous decomposition, the *compound tincture of Cardamoms* answers such an object in the *compound decoction of Aloes.* Tinctures are sometimes made with ether, but they are, generally, more strongly characterized by the nature of the menstruum, than by that of the substances dissolved in it, indeed ether is used in these cases, not to dissolve substances

which would resist the action of alcohol and water, but for the sake of its own direct action on the body; thus the Edinburgh Pharmacopœia directs an *Ethereal Tincture of Aloes*, which is more penetrating, and stimulant, than the alcoholic tinctures; the London College, with the exception of the *Aromatic Spirit of Æther*, does not recognise any preparation of this nature: in the *Ethereal Tincture of Digitalis* of the French Codex, than which, nothing can be more injudicious, the digitalis does not amount to more than 1-70th part of the tincture, and must therefore be entirely counteracted by the stimulant effects of the menstruum. The same objection cannot be urged against the ethereal tinctures of *Castor*, *Musk*, and *Amber*, since, in these cases, the subject and the menstruum concur in their mode of operation.

Tinctures derive their names from the substances which impart activity to them, and as the medicinal history of each substance, is detailed under its proper head, it will be unnecessary to dwell at any length, upon the individual virtues of these tinctures.—*Paris' Pharmacologia.*

TINCTURA ALOES. *A. L. D.* Tinctura Aloes Socotorinæ. *E.*

Tincture of Aloes.

Take of

Socotorine aloes, in powder, . . . half an ounce;
Extract of liquorice, ... one ounce and a half;
Alcohol, ... four fluid ounces;
Water, ... one pint.

Digest for ten days, and pour off the depurated tincture.

In this simple tincture, all the active parts of the aloes are suspended in the menstruum. The extract of liquorice serves both to assist the suspension, and to cover the taste of the aloes; and in those cases where we wish for the operation of the aloes alone, this is perhaps one of the best formulæ for its exhibition in a fluid state. About an ounce may be taken for a dose.

TINCTURA ALOES ET MYRRHÆ. *A. E.*

Tinctura Aloes Composita. *L. D.* *Compound Tincture of Aloes.*

Tincture of Aloes and Myrrh. *Elixir Proprietatis.*

Take of

Myrrh, in powder, . . . two ounces;
Alcohol, ... one pint and a half;
Water, ... half a pint.

Mix the alcohol with the water, then add the myrrh; digest for five days; and lastly, add of

Socotorine aloes, in powder, . . an ounce and a half;
Saffron, ... one ounce.

Digest again for five days, and pour off the tincture from the sediment.

This is supposed to be an improvement on the elixir proprietatis of Paracelsus. This tincture differs considerably in strength from that of the London and Dublin formula; the latter contains one part of aloes to eight of the menstruum; the former one to sixteen, while the simple tincture already mentioned, contains but one to thirty-two. In prescription, these proportions must be attended to. The myrrh and saffron may add to its stimulating properties.

Tinctura Aloes Ætherea. *E.* *Ethereal Tincture of Aloes.*

Take of
- Myrrh,
- Socotorine aloes, of each, ... an ounce and a half;
- English saffron, ... one ounce;
- Sulphuric ether, with alcohol, . . . one pound.

Digest the myrrh with the liquor, for four days, in a close vessel; then add the saffron and aloes.

Digest again for four days, and, when the feces have subsided, pour off the tincture.

This tincture agrees generally, in its effects, with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself.

TINCTURA AMMONIATA AROMATICA. *A. E.*

Spiritus Ammoniæ Aromaticus. *D. L.*

Ammoniated Aromatic Tincture. Aromatic Spirit of Ammonia.

Take of
- Ammoniated alcohol, . . . half a pint;
- Oil of rosemary, ... one fluid drachm and a half;
- Oil of sassafras, ... one fluid drachm.

Mix them, that the oils may be dissolved.

TINCTURA ANGUSTURÆ. *A. D.*

Tinctura Bonplandiæ Trifoliatæ. *E.*

Tincture of Angustura.

Take of
- Angustura bark, in coarse powder, . . . two ounces;
- Proof spirit of wine, ... two pints.

Digest for seven days, and filter.

Angustura bark readily gives out its active principles to alcohol; hence the tincture is a convenient, and useful preparation.

TINCTURA ASSAFŒTIDÆ. *A. L. D. E.*

Tincture of Assafœtida.

Take of
Assafœtida, ... four ounces;
Alcohol, ... two pints;
Water, by measure, . . . eight ounces.
Add the spirit to the gum-resin, triturated with the water; digest for ten days and strain.

As a gum-resin, the above formula of the Dublin College is certainly preferable to the others.

This tincture possesses the virtues of the assafœtida itself; and may be given in doses of from ten drops to fifty or sixty.

TINCTURA CAMPHORÆ. *A. E.*

Spiritus Camphoræ. *L.* Spiritus Camphoratus. *D.*

Tincture of Camphor. Spirit of Camphor. Camphorated Spirit.

Take of
Camphor, . . . one ounce;
Alcohol, ... one pound.
Mix them together, that the camphor may be dissolved.
(It may also be made with a double, triple, &c. proportion of camphor.) *E.*

This solution of camphor is only employed for external uses, against rheumatic pains, paralytic numbnesses, inflammations, for discussing tumours, preventing gangrenes, or restraining their progress. They are too pungent to be exhibited internally, and cannot be diluted with water, without being totally decomposed.

The American Pharmacopœia orders it, in the Latin formula, to be erroneously made with *diluted* alcohol.

TINCTURA CAMPHORÆ OPIATA. *A.*

Opiated Tincture of Camphor.

Tinctura Opii Camphorata. *E. D.* *Camphorated Tincture of Opium.*

Tinctura Camphoræ Composita. *L.*

Compound Tincture of Camphor. Paregoric Elixir. Asthmatic Elixir.

Take of
Opium,
Benzoic acid,
Oil of anise, each, . . . one drachm;
Liquorice, ... half an ounce;
Clarified honey, ... two ounces;
Camphor, ... two scruples;
Diluted alcohol, ... two pints.
Digest for ten days, and filter.

In this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin and essential oil. The latter will also render it more stimulating; but whether it derives any salutary virtues from the former, we do not know. It was originally prescribed under the title of Elixir Asthmaticum, which it does not ill deserve. It contributes to allay the tickling which provokes frequent coughing; and at the same time it is supposed to open the breast, and give greater liberty of breathing. It is given to children against the chincough, &c. from five drops to twenty: to adults, from twenty to a hundred. Half an ounce, by measure, contains about a grain of opium.

The American Pharmacopœia has designated this preparation by a *new name*, which certainly is not so superior to the former, as to compensate for the evil of change in nomenclature. It has also added two articles, in honey and liquorice; the latter of which, at least, is found in some old formulæ for the asthmatic elixir, with what very evident indication, would be difficult to say.

Tinctura Opii Ammoniata; olim, Elixir Paregoricum. *E.*

Ammoniated Tincture of Opium, formerly *Paregoric Elixir.*

Take of
- Benzoic acid,
- English saffron, of each, . . . three drachms;
- Opium, ... two drachms;
- Essential oil of aniseed, . . . half a drachm;
- Ammoniated alcohol, ... sixteen ounces.

Digest for seven days, in a close vessel, and strain.

This is a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c. the ammonia removing the spasms immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium.

TINCTURA CANTHARIDUM. *A.* Tinctura Cantharidis. *D.* Tinctura Cantharidis Vesicatoriæ. *E.* Tinctura Lyttæ. *L.*

Tincture of Cantharides, or Spanish Flies.

Take of
- Cantharides, bruised, . . . three drachms;
- Diluted alcohol, ... two pints.

Digest for ten days, and strain.

This tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a stimulant and rubefacient, and is sometimes given internally, in doses of from ten to twenty drops, as a diuretic. It has been usefully employed in cases of gleet in small doses. I have however heard of a practitioner

who used this powerful remedy in a case of gleet, beginning with doses of sixty drops, until he had gradually increased the amount to even 1500 drops in twenty-four hours. He informed the patient that no benefit was to be expected from it, *unless it produced a new action;* which unfortunately for the patient, took place, in inflammation and suppuration in some parts of the genital organs! Such a practice cannot be too severely reprehended.

TINCTURA CAPSICI. *A. L. D.* *Tincture of Cayenne Pepper.*

Take of
Cayenne pepper, . . . one ounce;
Diluted alcohol, . . . two pints.
Digest for ten days, and filter.

TINCTURA CAPSICI ET CANTHARIDUM. *A.*

Tincture of Cayenne Pepper and Cantharides.

Take of
Cantharides, bruised, . . ten drachms;
Cayenne pepper, ... one drachm;
Diluted alcohol, ... one pint.
Digest for ten days, and filter.

These are very powerful acrid stimulants. The former has been recommended in gangrenous sore throats.

TINCTURA CARDAMOMI. *A. L. D.*

Tinctura Amomi Repentis. *E.* *Tincture of Cardamom.*

Take of
Cardamom, bruised, . . four ounces;
Diluted alcohol, ... two pints and a half.
Digest for ten days, and filter.

Tincture of cardamoms has been in use for a considerable time. It is a pleasant warm cordial; and may be taken, along with any proper vehicle, in doses of from a drachm to a spoonful or two.

Tinctura Cardamomi Composita. *L. D.*

Compound Tincture of Cardamom.

Take of
Lesser cardamom seeds, husked, and bruised,
Cochineal,
Caraway seeds, each, powdered, . . . two drachms;
Cinnamon, bruised, ... half an ounce;
Proof spirit, ... two pints.
Digest for fourteen days, and strain.

This tincture contains so small a proportion of cardamoms as to be hardly entitled to derive its name from that article.

TINCTURA CASTOREI. *A. L. D. E.* *Tincture of Castor.*

Take of
Russian castor, powdered, . . two ounces;
Alcohol, ... two pints.
Digest for ten days, and filter.

It has been disputed whether a weak or rectified spirit, and whether cold or warm digestion, are preferable for making this tincture.

From several experiments made to determine this question, it appears that castor, macerated without heat, gives out its finer and most grateful parts to either spirit, but most perfectly to the rectified; that heat enables both menstrua to extract the greatest part of its grosser and more nauseous matter; and that proof spirit extracts this last more readily than rectified.

The tincture of castor is recommended in most kinds of nervous complaints and hysteric disorders: in the latter, it sometimes does service, though many have complained of its proving ineffectual. The dose is from twenty drops to forty, fifty, or more.

Tinctura Castorei Composita. *E.*

Compound Tincture of Castor.

Take of
Russian castor, ... one ounce;
Assafœtida, ... half an ounce;
Ammoniated alcohol, . . . one pound.
Digest for seven days, and filter through paper.

This composition is a medicine of efficacy, particularly in hysterical disorders, and the several symptoms which accompany them. The spirit here used is an excellent menstruum, both for the castor and the assafœtida, and greatly adds to their virtues.

TINCTURA CATECHU. *A. L. D.*

Tinctura Acaciæ Catechu. *E.* Tinctura Japonica.

Tincture of Catechu.

Take of
Catechu, ... three ounces;
Cinnamon, bruised, . two ounces;
Diluted alcohol, . . . two pints.
Digest for ten days, and filter.

The cinnamon is a very useful addition to the catechu, not only as it warms the stomach, &c. but likewise as it improves the roughness and astringency of the other.

This tincture is of service in all kinds of defluxions, catarrhs, loosenesses, uterine fluxes, and other disorders, where astringent medicines are indicated. Two or three tea-spoonfuls may be taken every now and then in red wine, or any other proper vehicle.

TINCTURA CINCHONÆ. *A. D. L.*

TINCTURA CINCHONÆ LANCIFOLIÆ. *E.*

Tincture of Cinchona. Tincture of Peruvian Bark.

Take of

Lance-leaved cinchona bark, in powder, . . seven ounces;
Proof spirit, ... two pints.

Macerate for fourteen days, and filter.

We prefer the London formula, because it is the strongest.

This tincture is certainly impregnated with the virtues of cinchona, but not to such a degree that it can be given in sufficient doses to act as chincona, without exhibiting more alcohol than is proper to be given as a medicine. Indeed, we are afraid that this and other bitter and tonic tinctures, as they are called, are with some only an apology for dram-drinking, and that the most apparent effects they produce are those of a slight degree of intoxication.

TINCTURA CINCHONÆ COMPOSITA. *A. L. D. E.*

Compound Tincture of Peruvian Bark.

Take of

Peruvian bark, powdered, . . two ounces;
Orange peel, dried, ... one ounce and a half;
Virginia snake-root, bruised, . three drachms;
Saffron,
Red sanders, each, ... one drachm;
Diluted alcohol, ... one pint and a half.

Digest for ten days, and filter.

The American Pharmacopœia has changed the cochineal for red sanders! we are to learn why this *important* alteration was made, especially as the santalum is not one of its standards, but merely secondary.

This has been for a considerable time celebrated under the title of *Huxham's Tincture of Bark.*

As a corroborant and stomachic, it is given in doses of two or three drachms: but when employed for the cure of intermittents, it must be taken to a greater extent.

Tinctura Cinchonæ Ammoniata. *L.*

Ammoniated Tincture of Cinchona.

Take of
Cinchona, powdered, ... four ounces;
Compound spirit of ammonia, . . . two pints.
Digest in a close vessel for ten days, and strain.

We are not acquainted with this tincture; but from our knowledge of the active principles of cinchona bark, we are not disposed to think it a very judicious preparation; for the nature of the menstruum is so stimulating, that little effect can be expected from any portion of the bark it is capable of dissolving.

TINCTURA CINNAMOMI. *A. L. D.*

Tinctura Lauri Cinnamomi. *E.* *Tincture of Cinnamon.*

Take of
Cinnamon, ... three ounces;
Diluted alcohol, . . . two pints and a half.
Macerate for seven days, and strain through paper.

The tincture of cinnamon possesses the astringent virtues of the cinnamon, as well as its aromatic cordial ones; and in this respect it differs from the distilled waters of that spice.

Tinctura Cinnamomi Composita. *E. L. D.*

Compound Tincture of Cinnamon.

Take of
Cinnamon, bruised, ... six drachms;
Lesser cardamom seeds, without the capsules, . . one drachm;
Long pepper, in powder,
Ginger, in powder, of each, ... two drachms;
Proof spirit, ... two pounds.
Mix and digest for seven days, then strain.

In their formula, the London and Dublin colleges diminish the quantity of cardamom seeds, and substitute for it a proportion of ginger. This makes no alteration in the virtues of the preparation, which is a very warm aromatic, too hot to be given without dilution. A tea-spoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakness of the stomach, flatulencies, and other similar complaints; and in these cases, it is often employed with advantage.

TINCTURA COLOMBÆ. *A. E.*

TINCTURA COLUMBÆ. *L.* TINCTURA COLUMBO. *D.*

Tincture of Columbo.

Take of
Columbo, sliced, . . two ounces and a half;
Diluted alcohol, . . two pints.
Digest for ten days, and filter.

The colombo readily yields its active qualities to the menstruum here employed; and accordingly, under this form, it may be advantageously employed against bilious vomitings, and those different stomach complaints, in which the colombo has been found useful; but where there does not occur some objection to its use in substance, that form is, in general, preferable to the tincture.

TINCTURA DIGITALIS. *A. D. L.*

TINCTURA DIGITALIS PURPUREÆ. *E.* *Tincture of Foxglove.*

Take of
The dried leaves of foxglove, . . two ounces;
Diluted alcohol, ... one pint.
Digest for seven days, and strain through paper.

This tincture is a very powerful medicine, and contains the virtues of the foxglove, in a very manageable form. It has been chiefly used to diminish the force of the circulation of the blood in hæmoptysis, and often with remarkable success. It has been also said to cure phthisis pulmonalis, but subsequent experience has not confirmed the first trials. Like every other form in which foxglove is given, it should be given in very small doses at first, such as from ten to twenty drops, and cautiously increased.

TINCTURA GENTIANÆ. *A.*

TINCTURA GENTIANÆ COMPOSITA. *E. L. D.*

(*Compound*) *Tincture of Gentian. Stomachic Elixir.*

Take of
Gentian, sliced, ... two ounces;
Orange peel, dried, . . one ounce;
Cardamom, bruised, . half an ounce;
Diluted alcohol, . . . two pints.
Digest for ten days, and filter.

This is a very elegant spirituous bitter. As the preparation is designed for keeping, lemon peel, an excellent ingredient in the watery bitter infusions, has, on account of the perishableness of its flavour, no place in this.

TINCTURA GUAIACI. *A. D. L.*

TINCTURA GUAIACI OFFICINALIS. *E.* *Tincture of Guaiac.*

Take of
  Guaiac, in powder, . . half a pound;
  Alcohol, ... two pints.
Macerate fourteen days and filter.

The Edinburgh College formerly directed one pound of Guaiac to two pounds and a half of alcohol; the resin was in too large amount; and in the last edition of their Pharmacopœia, the proportion is six ounces to the same amount of alcohol. The American Pharmacopœia has, however, chosen the largest proportion. We think the one of London, above, superior and better proportioned.

What is called gum guaiac is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating sudorific, and may be given in doses of about half an ounce, in rheumatic and arthritic cases. It was once supposed to be a specific against the gout.

TINCTURA GUAICI AMMONIATA. *A. E. L. D.*

Ammoniated Tincture of Guaiac.

Take of
  Guaiac, in powder, ... four ounces;
  Ammoniated alcohol, . . . one pound and a half.
Digest for ten days, and filter through paper.

This is a very elegant and efficacious tincture; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatic cases, a tea, or even a table spoonful, taken every morning and evening, in any convenient vehicle, particularly in milk, has proved of singular service. It is rendered much more agreeable by adding an ounce of the oil of sassafras to the ingredients.

This is a solution of the guaiac in the aromatic spirit of ammonia, and is, consequently, more stimulating than the preceding one, and more efficacious as a sudorific: after arterial action is properly reduced, it is certainly one of our best remedies in rheumatism. *Dose,* from one to two fluid drachms, at bed time, and its effects should be promoted by some warm beverage. It is worthy of remark, that nitrous acid, and the spirit of nitric ether, occasion an extraordinary decomposition in these tinctures, separating the guaiacum into coagulated masses, and imparting to the whole an intense bluish green colour. *Chlorine* has the same effect;* but the

* The change of colour which Guaiacum undergoes by admixture with other bodies, not only affords a test by which we may appreciate its purity, but at the same time it becomes a re-agent by which we may assay the virtues of other vegetable sub-

sulphuric and muriatic acids produce no disturbance. If equal parts of quick-lime and powdered guaiacum be rubbed together, and a quantity of water be poured over them, and the mixture be allowed to stand until it becomes fine, we shall obtain a solution of this substance, which will mix in any proportion with aqueous vehicles without decomposition, and to which the aromatic spirit of ammonia may be subsequently added, without effect.

TINCTURA HELLEBORI NIGRI. *A. D. E. L.*

Tincture of Black Hellebore.

Take of
Black hellebore, sliced, . . four ounces;
Diluted alcohol, ... two pints.
Digest for ten days, and filter.

This is, perhaps, the best preparation of hellebore, when designed for an alterative, the menstruum here employed, extracting the whole of its virtues. It has been found, from experience, particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said, that it seldom fails of exciting the menstrual evacuations, and removing the ill consequences of their suppression. A tea-spoonful of the tincture may be taken twice a day in warm water, or any other convenient vehicle.

TINCTURA HUMULI. *A. L.*

Tinctura Humuli Lupuli. *E.* *Tincture of Hops.*

Take of
Hops, ... four ounces;
Alcohol, . . . one pint.
Beat out the yellow powder from the hops, and digest it ten days in the alcohol; then filter.

Opium, in every form, disagrees so completely with some people, as to render its exhibition to them, improper. In these cases, we must have recourse to other narcotics, and of them, the hop is one of the safest and most agreeable. Its comparative strength is not yet well ascertained, nor even the best form of exhibiting it. It is difficultly pulverizable, and in its natural form, it is so extremely light and

stances. According to the experiments of M. Taddey and Rudolphi, it appears that Guaiacum in powder, is an excellent test for vegetable gluten, forming with it a fine blue colour, whence it offers the means of determining the quality of wheat flour. From the experiments of M. Planche, it moreover appears, that there is a series of vegetable roots, which, when fresh, are capable of producing a blue colour, if introduced into an alcoholic solution of Guaiacum, so that we may hereafter be furnished with a chemical test, that will at once appreciate their freshness, which is undoubtedly one of the greatest desiderata of pharmaceutical science. Mr. A. T. Thomson has proposed Guaiacum as a test of the freshness of Colchicum.

bulky, as to absorb and retain a great deal of the spirit employed to extract a tincture from it, even when subjected to much compression. These difficulties are, in some measure, overcome, since the discovery of Dr. Ives, adverted to in the history, &c. of Humulus, and of which, advantage is taken in the American Pharmacopœia.

TINCTURA HYOSCIAMI. *A. D. L.*

TINCTURA HYOSCIAMI NIGRI. *E.* *Tincture of Henbane.*

Take of
Henbane, dried, and coarsely powdered, two ounces and a quarter;
Diluted alcohol, one pint.
Digest for ten days, and filter.

This tincture, although not yet come into general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation, or, instead of its usual soporific and sedative effects, it causes uneasiness, restlessness, and universal irritation.

An anonymous correspondent observes, that it is useful in recent coughs, in doses for an adult of not less than thirty drops, with ten drops of laudanum, which is equal to thirty drops of the latter. Tincture of henbane alone, sometimes purges; when this is an inconvenience, it is corrected by the addition of a few drops of laudanum.

TINCTURA JALAPÆ. *A. L. D.*

TINCTURA CONVOLVULI JALAPÆ. *E.* *Tincture of Jalap.*

Take of
Jalap, powdered, . . eight ounces;
Diluted alcohol, . . two pints.
Digest for ten days, and filter.

Alcohol was formerly ordered for the preparation of this tincture; but diluted alcohol is a preferable menstruum, as it dissolves the active constituents of the jalap, as well as pure alcohol, and is less stimulating.

TINCTURA KINO. *A. E. D. L.* *Tincture of Kino.*

Take of
Kino, powdered, . . three ounces;
Diluted alcohol, . . two pints.
Digest for ten days, and filter.

An excellent astringent tincture.

TINCTURA LAVANDULÆ. *A.*

SPIRITUS LAVANDULÆ COMPOSITUS. *E. L. D.*

Tincture of Lavender. Compound Tincture or Spirit of Lavender.

Take of
Spirit of lavender, ... three pints;
Spirit of rosemary, ... one pint;
Cinnamon, bruised, ... one ounce;
Cloves, bruised, ... two drachms;
Nutmeg, bruised, ... half an ounce;
Red sanders, in shavings, . three drachms.
Digest for ten days, and filter.

This preparation is a grateful cordial, of which from ten to a hundred drops may be conveniently taken dropped upon sugar. It does not appear very clearly, whether it should be considered as a spirit or tincture; for although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent colouring, and other substances, which would not rise with it in distillation.

TINCTURA LOBELIÆ. *A.* *Tincture of Indian Tobacco.*

Take of
Indian tobacco, . . two ounces;
Diluted alcohol, . . one pint.
Digest for ten days, and filter.

TINCTURA MENTHÆ PIPERITÆ. *A.*

Tincture of Peppermint.

Take of
Oil of peppermint, . . two fluid drachms;
Alcohol, ... one pint.
Digest till the oil is thoroughly blended with the alcohol.

TINCTURA MENTHÆ VIRIDIS. *A.* *Tincture of Spearmint.*

Take of
Oil of spearmint, . . two fluid drachms;
Alcohol, ... one pint.
Digest till the oil is thoroughly blended with the alcohol.

It is very doubtful whether these should be denominated tinctures; the first is, however, the essence of peppermint of the shops; a well known patent nostrum, of which several formulæ exist, viz:

1. One pint of alcohol to half an ounce of oleum menthæ piperitæ.

2. Two gallons of alcohol to one pound of oleum menthæ piperitæ, coloured with eight ounces of the dry plant.

3. Two pints of alcohol, three ounces of oleum menthæ piperitæ, coloured with spinage, sometimes with saffron.

All, however, far exceed in strength that which is here adopted by the American Pharmacopœia; one ounce to a pint is a very good proportion, and may answer for every purpose. The second tincture of mint might very well be omitted.

TINCTURA MOSCHI. *A. D.* *Tincture of Musk.*

Take of
Musk, . . . two drachms;
Alcohol, . . one pint.
Digest for ten days, and filter.

Alcohol is the most complete menstruum for musk; but in this form it is often impossible to give such a quantity of the musk as is necessary for our purpose; and hence this article is more frequently employed under the form of julep or bolus. But in whatever way this article (*musk*) is administered, we are persuaded that more is due to the co-operating agencies of wine, ammonia, and other stimulants, than to any positive powers of the musk itself: was it not so very dear a remedy, it would never be preferred to assafœtida.

TINCTURA MYRRHÆ. *A. E. L. D.* *Tincture of Myrrh.*

Take of
Myrrh, in powder, . . . three ounces;
Alcohol, ... twenty ounces;
Water, ... ten ounces.
Digest for seven days, and strain through paper.

Tincture of myrrh is recommended internally as a cardiac, for removing obstructions, particularly those of the uterine vessels, and resisting putrefaction. The dose is from fifteen drops to forty or more. The medicine may perhaps be given in these cases to advantage; though it is more commonly used externally, for cleaning foul ulcers, and promoting the exfoliation of carious bones.

TINCTURA OPII. *A. E. L. D.* Tinctura Thebaica.
Tincture of Opium. *Thebaic Tincture.*
Laudanum Liquidum. *L.* *Liquid Laudanum.*

Take of
Opium, powdered, . . two ounces;
Diluted alcohol, . . . two pints.
Digest for ten days, and filter.

The tinctures of opium of the different Pharmacopœias, on evaporation, furnish the same quantity of extract; they are believed to be of nearly equal strength; but it is to be regretted that they are not so well adapted for keeping as could be wished: after some time, a part of the opium is gradually deposited from both, and consequently the tinctures become weaker: the part which thus separates, amounts sometimes, it is said, to near one-fourth of the quantity of opium at first dissolved. Mr. Phillips found, that when alcohol of specific gravity 0.930 was employed with select crude opium the tincture acquired specific gravity 0,925, and contained 36 grains of opium *per* fluid ounce; but when purified opium was used, the specific gravity of the tincture was 0.958, and the quantity of opium in the fluid-ounce 36 grains; of the crude opium one grain in 3.5 remained undissolved, and of the purified only one in twenty-five; while in the tincture made with the former, one grain of opium was contained in 18.3 minims, and in that with the latter in 13.3, so that from calculation the strength of the tincture made with purified opium to that made with crude opium is as three to two nearly. But we must here observe, that calculation cannot be altogether relied upon in this case, because, although purified opium contains more soluble matter than crude opium, its narcotic powers are diminished by the preparation it has undergone.

It is certain that some good experimental essay is still much wanted on the subject of opium and its preparations. Laudanum prepared in the most careful manner, and filtered so as to be perfectly transparent, will, in a few months, deposite a very large precipitate; and if again filtered, will again, in some months, deposite a second quantity. This has more than once led to fatal consequences in its administration, and it is therefore very desirable to have a preparation, which shall at all times continue equally charged with the active principle. Perhaps an approximation to such a preparation may be obtained by making it at a determinate temperature, say 180° Fah. and when complete and filtered, let it be then subjected to the action of ice in any convenient way, say for twelve hours. This cold, as in all spirituous solutions, will cause a cloudiness, and gradual deposite; which will leave the tincture of a strength less likely to vary afterwards. I find eight ounces of alcohol diluted to the strength of brandy or proof spirit, takes up during summer in a month, with frequent agitation, from half an ounce of good *dry* opium in powder very nearly *two drachms*, which remains in solution till the cold weather, when a deposit of some amount ensues; and if cleared from it, a second deposit sooner or later takes place. A similar experiment made with common, but strong vinegar, gave evidence of nearly an equal power of holding opium in solution; but a cloudiness began to ensue in the acetic solution, in less than two weeks, a sediment deposited; and by the end of a month, a complete scum, or *mother*, formed on the surface, with a still further deposit; the addition of half an ounce of alcohol was barely sufficient to check the disposition to further change.

We recommend this as a fit subject for an inaugural dissertation,

and one, which, if properly pursued, will be creditable to the author, as it will prove useful in pharmacy.

TINCTURA QUASSIÆ. *A. E. D.* *Tincture of Quassia.*

Take of
Shavings of quassia, . . . one ounce;
Proof spirit, ... two pints.
Digest for seven days, and filter.

As the Dublin College have introduced into their Pharmacopœia the most powerful of all astringent tinctures, in the present instance they have also first directed a tincture to be prepared from the purest and most intense of all bitters; and in both instances they have been followed by the Edinburgh College, and now by the American Pharmacopœia.

TINCTURA RHEI. *A. E. L.*

Tinctura Rhabarbari. *D.* *Tincture of Rhubarb.*

Take of
Rhubarb, ... three ounces;
Lesser cardamom seeds, . . . half an ounce;
Diluted alcohol, ... two pounds and a half.
Digest for seven days, and strain through paper.

Tinctura Rhei Composita. *L.* *Compound Tincture of Rhubarb.*

Take of
Rhubarb, sliced, ... two ounces;
Liquorice root, bruised, . . . half an ounce;
Ginger powdered,
Saffron, each, ... two drachms;
Distilled water, ... one pint;
Proof spirit of wine, ... twelve ounces, by measure.
Digest for fourteen days, and strain.

TINCTURA RHEI ET ALOES. *A. E.*

Tincture of Rhubarb and Aloes; formerly, *Elixir Sacrum.*

Take of
Rhubarb, ... ten drachms;
Socotorine aloes, ... six drachms;
Lesser cardamom seeds, . . . half an ounce;
Diluted alcohol, ... two pounds and a half.
Digest for seven days, and strain through paper.

TINCTURA RHEI ET GENTIANÆ. *A. E.*

Tincture of Rhubarb and Gentian.

Take of
Rhubarb, ... two ounces;
Gentian root, ... half an ounce;
Diluted alcohol, . . . two pounds and a half.
Digest for seven days, and then strain the tincture through paper.

TINCTURA RHEI DULCIS. *A.* *Sweet Tincture of Rhubarb.*

Take of
Rhubarb, bruised, . . . two ounces;
Liquorice, bruised,
Anise, bruised, each, . one ounce;
Sugar, ... two ounces;
Diluted alcohol, ... two pints and a half.
Digest for ten days, and filter.

This is an old prescription revived with slight alterations. It might as well have continued its slumber.

All the foregoing tinctures of rhubarb are designed as stomachics, and corroborants, as well as purgatives: spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside, and the additional ingredients considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhœas, colic, and other similar complaints, these medicines are frequently of great service.

TINCTURA SANGUINARIÆ. *A.* *Tincture of Bloodroot.*

Take of
Bloodroot, coarsely powdered, . . two ounces;
Diluted alcohol, ... one pint.
Digest for ten days, and filter.

For its virtues, see Sanguinaria.

TINCTURA SCILLÆ. *D. L.* TINCTURA SCILLÆ MARITIMÆ. *E.*

Tincture of Squills.

Take of
Squills, fresh dried, ... four ounces;
Proof spirit of wine, . . . two pints.
Digest for eight days, and pour off the liquor.

The active principle of squills is soluble in alcohol, and there are cases in which a tincture may be useful.

TINCTURA SAPONIS ET OPII. *A. E.*

Linimentum Anodynum.

Tincture of Soap and Opium. Anodyne Liniment.

Take of
- Soap, in shavings, . . four ounces;
- Camphor, ... two ounces;
- Opium, in powder, . . one ounce;
- Oil of rosemary, . . . half an ounce;
- Alcohol, ... two pints.

Digest the soap and opium in the alcohol three days, then filter and add the camphor and oil, and dissolve.

Tinctura Saponis Camphorata. *E.* Linimentum Saponis. *D.*

Linimentum Saponis Compositum. *L.*

Camphorated Tincture of Soap. Soap Liniment.

Compound Soap Liniment.

This is made as the preceding, omitting the opium. It differs but little from the so called *opodeldoc.*

These tinctures are only used externally, and are efficacious in removing local pains. This last tincture, with a sixth part of the tincture of cantharides, forms a most excellent liniment for chilblains.

Linimentum Camphoræ Compositum. *L.*

Compound Camphor Liniment.

Take of
- Camphor, ... two ounces;
- Water of ammonia, ... six ounces;
- Spirit of lavender, ... sixteen ounces.

Mix the water of ammonia with the spirit; and distil from a glass retort, with a slow fire, sixteen ounces. Then dissolve the camphor in the distilled liquor.

This is more pungent and penetrating than the solution of camphor in alcohol. Is the distillation necessary to get an ammoniated alcohol without water? Probably. Mr. Phillips, dreading the extreme causticity of the *aqua ammoniæ* of the present Pharmacopœia, proposes the substitution of an equivalent quantity of subcarbonat of ammonia.

LINIMENTUM VOLATILE. *D.* *Volatile Liniment.*

Take of
The aromatic spirit of volatile alkali, . . . one ounce;
Liniment of soap, ... two ounces.
Mix them.

This is an entirely different composition from the volatile liniment of the Edinburgh and London Pharmacopœias. The latter is a soap formed of ammonia and fixed oil, whereas the present is an ammoniated tincture of camphor, soap of soda, and volatile oils. In its effects it differs from the soap-liniment of the Dublin College only in being more stimulating.

TINCTURA SENNÆ AROMATICA. *A.*

Aromatic Tincture of Senna. Warner's Gout Cordial.

As the American Pharmacopœia has omitted a very essential ingredient in this celebrated preparation of Warner, we give the formula from the London edition of his Treatise on Gout, for 1768, p. 205.

Take of
Raisins, sliced and stoned, . . . half a pound;
Senna, ... two drachms;
Coriander seeds,
Fennel seeds, each, ... one drachm;
Cochineal,
Saffron,
Liquorice, each, ... half a drachm;
Rhubarb, sliced thin, ... one ounce.
Infuse these in a quart of French brandy for ten days, then strain it off, and add a pint more to the same ingredients. Let it stand until the virtue is extracted, then strain it off, and mix the first and last together.

Take four or five spoonsful of this cordial in as many of boiling water as will make it as hot as can be drank; and if the pain is not removed in half an hour, repeat it; and so continue repeating it until it is. If the stomach will not retain it, take ten drops of laudanum, and this in the interspaces.

We presume the omission of the rhubarb by the American Pharmacopœia, is altogether accidental.

TINCTURA SENNÆ COMPOSITÆ. *A. E.*

TINCTURA SENNÆ. *D. L.* ELIXIR SALUTIS.

Compound Tincture of Senna. Elixir of Health.

Take of
Senna, ... three ounces;
Jalap, bruised, ... one ounce;
Coriander,
Caraway, each, bruised, . . half an ounce;
Cardamom, bruised, ... two drachms;
Diluted alcohol, ... three pints and a half.
Digest for ten days, then filter, and add of
Sugar, ... four ounces.

This tincture is an useful carminative and cathartic, especially to those who have accustomed themselves to the use of spirituous liquors; it often relieves flatulent complaints and colics, where the common cordials have little effect: the dose is from one to two ounces.

TINCTURA SERPENTARIÆ. *A. L. D. E.*

Tincture of Snake-Root.

Take of
Virginia snake-root, sliced and bruised, . . . three ounces;
Proof spirit, ... two pints.
Digest for eight days, and strain.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as a useful diaphoretic. The American Pharmacopœia uses only two ounces of the root.

TINCTURA AURANTII. *L. D.* *Tincture of Orange Peel.*

Take of
Fresh orange-peel, ... three ounces;
Proof spirit, ... two pints.
Digest for three days, and strain.

This tincture is an agreeable bitter, flavoured at the same time with the essential oil of the orange-peel.

Tinctura Benzoes Composita. *D.*

Tinctura Benzoini Composita. *E. L.*

Compound Tincture of Benzoin.

Take of
- Benzoin, ... three ounces;
- Storax, strained, ... two ounces;
- Balsam of Tolu, ... one ounce;
- Socotorine aloes, ... half an ounce;
- Rectified spirit of wine, ... two pints.

Digest with a gentle heat for seven days, and strain.

This preparation may be considered as a simplification of some very complicated compositions, which were celebrated under different names; such as Baume de Commandeur, Wade's Balsam, Friars' Balsam, Jesuits' Drops, &c. These, in general, consisted of a confused farrago of discordant substances.

Tinctura Cascarillæ. *L. D.*

Tinctura Crotonis Eleutheriæ. *E.* *Tincture of Cascarilla.*

Take of
- The bark of cascarilla, powdered, . . . four ounces;
- Proof spirit, ... two pints.

Digest with a gentle heat for eight days, and strain.

Proof spirit readily extracts the active power of the cascarilla; and the tincture may be employed to answer most of those purposes for which the bark itself is recommended: but in the cure of intermittents, it in general requires to be exhibited in substance.

This, like many other tinctures, may be considered merely as a dram, and it would be well, if the number could be greatly reduced.

Tinctura Croci. *E. D.* *Tincture of Saffron.*

Take of
- English saffron, ... one ounce;
- Diluted alcohol, ... fifteen ounces.

After digesting them for seven days, let the tincture be strained through paper.

The proof spirit is a very proper menstruum for extracting the medical virtues of the saffron, and affords a convenient mode of exhibiting that drug, the qualities of which have been already mentioned.

Tinctura Galbani. *L. D.* *Tincture of Galbanum.*

Take of
Galbanum, cut into small pieces, . . . two ounces;
Proof spirit of wine, ... two pints.
Digest with a gentle heat for eight days, and strain.

Galbanum is one of the strongest of the fetid gums; and although less active, it is much less disagreeable than assafœtida; and under the form of tincture it may be successfully employed in cases of flatulence and hysteria, where its effects are immediately required, particularly with those who cannot bear assafœtida.

Tinctura Gallarum. *D. E.* *Tincture of Galls.*

Take of
Galls, in powder, ... four ounces;
Proof spirit, ... two pints.
Mix; digest for seven days, and filter.

This tincture, for the first time introduced into practice by the Dublin College, is, no doubt, the most powerful of all the astringent tinctures.

TINCTURA STRAMONII. *A.* *Tincture of Thorn-apple.*

Take of
Thorn-apple seeds, bruised, . . two ounces;
Diluted alcohol, ... one pint.
Digest for ten days, and filter.

TINCTURA TOLUTANI. *A.*

Tinctura Toluiferi Balsami. *E.* Tinctura Balsami Tolutani. *D.*

Tincture of Tolu. Tincture of Balsam of Tolu.

Take of
Tolu, . . . one ounce and a half;
Alcohol, . one pint.
Digest till the tolu is dissolved, then filter.

TINCTURA VALERIANÆ. *A. L. D.* *Tincture of Valerian.*

Take of
Valerian, ... four ounces;
Diluted alcohol, . . two pints.
Digest for ten days, and filter.

The valerian root ought to be reduced to a pretty fine powder, otherwise the spirit will not sufficiently extract its virtues. The tincture proves of a deep colour, and considerably strong of the valerian; though it has not been found to answer so well in the cure of epileptic disorders as the root in substance, exhibited in the form of powder or bolus. The dose of the tincture is, from half a spoonful, to a spoonful, or more, two or three times a day.

TINCTURA VALERIANÆ AMMONIATA. *A. L. D. E.*

Ammoniated Tincture of Valerian.

Take of
Valerian root, in coarse powder, ... four ounces;
Ammoniated alcohol, ... two pints.
Digest for ten days in a vessel closely covered, and strain.

The compound spirit of ammonia is here an excellent menstruum, and at the same time considerably promotes the virtues of the valerian, which in some cases wants assistance of this kind. The dose may be a tea-spoonful or two.

TINCTURA VERATRI VIRIDIS. *A.*

Tincture of Green Hellebore.

Take of
Green hellebore, bruised, . . eight ounces;
Diluted alcohol, ... two pints and a half.
Digest for ten days, and filter.

This is also called American hellebore by the American Pharmacopœia.

TINCTURA VERATRI ALBI. *E.* *Tincture of White Hellebore.*

Take of
White hellebore root, ... four ounces;
Diluted alcohol, ... sixteen ounces.
Digest them together for seven days, and filter the tincture through paper.

This tincture is sometimes used for assisting cathartics, &c. and as an emetic in apoplectic and maniacal disorders. It may likewise be so managed, as to prove a powerful alterative and deobstruent, in cases where milder remedies have little effect. But a great deal of caution is requisite in its use: the dose, at first, ought to be only a few drops; if considerable, it proves violently emetic or cathartic.

TINCTURIA ZINGIBERIS. *L. D. E.* *Tincture of Ginger.*

Take of
Ginger, powdered, ... two ounces ;
Proof spirit, ... two pounds.
Digest in a gentle heat for eight days, and strain.

This simple tincture of ginger is a warm cordial, and is rather intended as an useful addition, in the quantity of a drachm or two, to purging mixtures, than for being used alone.

ÆTHER SULPHURICUS CUM ALCOHOL. *E.* AROMATICUS. *E.*
Aromatic Sulphuric Ether with Alcohol.

Take of
Cinnamon, bruised,
Cardamom seeds, bruised, of each, . . one ounce ;
Long pepper, in powder, ... two drachms ;
Sulphuric ether with alcohol, ... two pounds and a half.
Digest seven days, and filter.

This is designed for persons whose stomachs are too weak to bear the following acid tincture : to the taste, it is gratefully aromatic, without any perceptible acidity.

TINCTURA ACIDI SULPHURICI. *A.*
ACIDUM SULPHURICUM AROMATICUM. *E.*
Aromatic Sulphuric Acid. Tincture of Sulphuric Acid.
Acid Elixir of Vitriol.

Take of
Alcohol, ... two pounds ;
Sulphuric acid, . . . six ounces ; (3 fl. ℥ *Am.*)
Drop the acid gradually into the alcohol.
Digest the mixture with a very gentle heat in a close vessel for three days, and then add of
Cinnamon, . . . an ounce and a half ;
Ginger, ... one ounce.
Digest again in a close vessel for six days, and then filter the tincture through paper placed in a glass funnel.

It is doubtful how far either of the above names are appropriate to this preparation. It has so long been well known under the name of Elixir of Vitriol, that it would be better retained, as it is quite as correct ; and no advantage is gained by the change. Is the medicine improved by the diminution of the amount of sulphuric acid in the American Pharmacopœia ? We think not.

Medical use.—This a valuable medicine in weakness and relaxations of the stomach, and decays of constitution, particularly in those which proceed from irregularities, which are accompanied with slow, febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromatics by themselves, had availed nothing; and, indeed, great part of its virtues depend on the sulphuric acid; which, barely diluted with water, has, in those cases where the stomach could bear the acidity, produced happy effects.

It is very usefully conjoined with cinchona, and other tonic barks, both as covering their disagreeable taste, and as coinciding with them in virtue. It may be given in doses of ten to thirty drops, or more, several times a day. It is best sucked from the glass by means of a quill, which prevents its coming in contact with the teeth.

TORMENTILLA. *A.* (*Secondary.*)

TORMENTILLA ERECTA. *E. D.* TORMENTILLA OFFICINALIS. *L.*

Tormentil. Septfoil. The Root.

Tormentil is perennial, and found wild in woods and on commons: it has long, slender stalks, with usually seven long, narrow, leaves at a joint; the root is, for the most part, crooked and knotty, of a blackish colour on the outside, and a reddish within. This root has an austere, styptic taste, accompanied with a slight kind of aromatic flavour; it is one of the most agreeable, and efficacious of the vegetable astringents, and is employed with good effect, in all cases where medicines of this class are proper. Neumann got from 960 grains, 365 alcoholic, and 170 watery extract; and inversely, 570 watery, and 8 alcoholic.

TRITICUM HYBERNUM. *E. L. D.*

Wheat. The Flour and Starch.

By some, spring and winter wheat are considered as varieties only, and not distinct species. The latter, however, is the most productive, and is most commonly cultivated on that account; for there is no material difference between the grains they produce, which are indiscriminately employed for every purpose.

Wheat-flour consists principally of gluten, starch, albumen, and a sweet mucilage. These may be separated, by forming the flour into a paste with a little water, and washing this paste with fresh quantities of water, until it runs from it colourless. What remains, is the gluten: which, if not the same, is very analogous to the fibrin of animal substances. From the water with which the paste was wash-

ed, a white powder separates on standing. This is the starch which we have already mentioned, under the title Amylum. The albumen and sweet mucilage remain dissolved in the water. By evaporating it, the albumen first separates in white flakes, and the sweet mucilage may be got by total evaporation.

It is the presence of gluten, which characterizes wheat flour; and on the due admixture of it with the other constituents, depends the superiority of wheat flour for baking bread.

Bread is made by working the flour into a paste with water, a quantity of some ferment, such as yeast, and a little muriat of soda to render it sapid, allowing the paste to stand until a certain degree of fermentation take place, and then baking it in an oven heated to about 488°. During the fermentation, a quantity of gas is formed, and as it is prevented from escaping by the toughness of the paste, and dilated by the heat of the oven, the bread is rendered light and spongy. In this process, the nature of the constituents of the flour is altered, for we are not able to obtain either gluten or starch from bread.

Medical use.—Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and giving form to more active articles. An infusion of toasted bread has a deep colour, and pleasant taste, and is an excellent drink in febrile diseases, and debility of the stomach.

Amylum. *Starch.*

Form.—White columnar masses;—*Odour and Taste,* none.

Chemical composition.—Fecula is one of the proximate principles of vegetable matter, and starch is the fecula of wheat; *sago,* of the cycas circinalis; *salop,* of the orchis mascula; *tapioca,* of the root of the jatropha manihot; *arrow-root,* of the maranta arundinacea. The greater part of what is sold under this last title, is the fecula of potatoes, 100 pounds of which, yield about 10 pounds of starch; and what may be worthy of notice, frozen potatoes yield it equally as well as those not spoiled by frost.

Solubility.—It is soluble in boiling water, forming a semi-transparent, insipid, inodorous, gelatinous paste, very susceptible of mouldiness, but which is retarded by the addition of alum. It is insoluble, but falls to powder in cold water; nor is it soluble in alcohol or ether. Although potass dissolves starch, yet the solution of it is not disturbed by potass, carbonat of potass, nor ammonia, but an alcoholic solution of potass, produces a precipitate; acetat of lead, and infusion of galls, also occasion precipitates. Starch is susceptible of several interesting and important changes; thus, if it be exposed to heat until its colour becomes yellow, its properties are so far altered, that it is no longer insoluble in cold water; and according to Saussure, if it be mixed with water, a spontaneous decomposition takes place, and a quantity of sugar is formed, amounting in weight to one half the starch employed, in addition to which, a peculiar

gummy matter results, and a substance, intermediate between gum and starch, to which the name of *amidine* has been given. Starch, moreover, is convertible into saccharine matter, by the agency of sulphuric acid.

Iodine is a delicate test of the presence of starch; if a drop or two of a solution of this substance in alcohol, be added to an aqueous solution of starch, a blue compound is formed, which eventually precipitates.

Starch is found in many vegetables, combined with different substances. Fourcroy, accordingly, makes various species of it; as, combined,

1. With gluten, or fibrin; as in wheat, rye, and other similar seeds.
2. With extractive; as in beans, peas, lupins, &c.
3. With mucilaginous matter; as in the potatoe, and many other roots; in unripe corn.
4. With saccharine matter in most roots, and in corn, after it has begun to germinate.
5. With oil; in the emulsive seeds, almonds, &c.
6. With an acrid principle; as in the root of the burdock, jatropha manihot, arum, asarum, and other tuberous roots.

Medical use.—As a constituent of many vegetable substances, it forms a most important alimentary substance. In a medical point of view, it is to be considered as a demulcent; and accordingly, it forms the principal ingredient of an officinal lozenge, and a mucilage prepared from it, often produces excellent effects, both taken by the mouth, and in the form of a clyster, in dysentery and diarrhœa, from irritation of the intestines. Externally, flour or starch is the usual application in erysipelatous affections of the skin, but upon what principle is not very apparent, unless it be an empirical practice, remaining from the pathology which dreaded the repulsion of all external inflammations.

TRAGACANTHA. *A.*

Astragalus Tragacantha. *E. D.* Astragalus Verus. *L.*

Tragacanth. Gum Tragacanth.

Tragacanth is opaque and white, not sweetish, very sparingly soluble in water, but absorbing, and forming a paste with a large quantity. Its solution is adhesive, but cannot be drawn out into threads. It moulds readily, and acquires a fetid smell. It is precipitated by nitrat of mercury. It is insoluble in alcohol, and seems to contain more nitrogen and lime than gum does.

Gum-Tragacanth is the produce of a very thorny shrub, which grows on the island of Candia, and other places in the Levant. According to Olivier, (Travels, 5th vol.) it is the produce of a species

of astragalus, not before known; he describes it under the name of *astragalus verus.* It grows in the north of Persia. His words are, "This gummy substance is formed from the month of July to the end of September, on the trunks of several species of Astragalus, which grow in Natolia, Armenia, Curdistan, and all the north of Persia. Tournefort has described one of these, which also furnishes tragacanth, which he found on Mount Ida in Crete; and La Billardierre has described, and figured another which he saw in Syria. The Astragalus, which appears to us the most common, and that from which almost all the Tragacanth of commerce is derived, has not been described by any botanist. It differs essentially from the two species which we have mentioned, in its habits and its flowers." In a note upon the description, which it is unnecessary to insert, he characterizes it as "*Astragalus verus,* fruticosus, foliolis villosis, setaceis, subulatis; floribus auxillaribus, aggregatis, luteis." After finishing the description, he continues, "Tragacanth exudes naturally, either from wounds made in the shrub by animals, or from fissures occasioned by the force of the *succus proprius,* during the great heats of summer. According as the juice is more or less abundant, tragacanth exudes in tortuous filaments, which sometimes assume the form of a small worm, or of a pretty thick worm, elongated, rounded, or compressed, rolled up upon itself, or twisted. The finest and purest tragacanth assumes this form. It is almost transparent, whitish, or of a yellowish white. It also exudes in large tears, which preserve more or less of the vermicular form. This is more of a reddish colour, and more contaminated with impurities. It sometimes adheres so strongly to the bark, as to bring part of it with it in gathering it. The quantity of tragacanth furnished by Persia, is very considerable. Much is consumed in that country, in the manufacture of silk, and the preparation of comfits. It is exported to India, Bagdad, and Bussorah. Russia also gets some by the way of Bakou."

About the end of June, a fluid exudes from the stem and larger branches, which dries in the sun, and is collected by the shepherds, on mount Ida, from whence it is sent to Europe, under the title of Tragacanth.

It consists of whitish semi-transparent vermiform pieces, scarcely a line in thickness, without taste or smell.

There is also a dirty yellow, or brownish kind, which is not fit for medical purposes.

Tragacanth is difficultly pulverizable, unless when thoroughly dried, and the mortar heated, or in frost. According to Neumann, it gives nothing over in distillation, either to water or alcohol: alcohol dissolves only about 10 parts of 480, and water, the whole. Lewis, however, more accurately observes, that it cannot be properly said to be dissolved, for, put into water, it absorbs a large proportion of that fluid, increasing immensely in volume, and forming with it a soft, but not fluid, mucilage; and although it is easily diffused through a larger proportion of water, after standing a day

or two, the mucilage subsides again, the supernatant fluid retaining little of the gum.

Besides these remarkable differences from gum arabic, in regard to brittleness, insolubility, and the quantity of water which it thickens; tragacanth is not precipitated by silicized potass, and is precipitated by sulphat of copper, and acetat of lead.

In pharmacy it is employed for forming powders into troches, and rendering tough, cohesive substances, such as colocynth, pulverizable, by beating them with mucilage of tragacanth, and then drying the mass. For electuaries it is improper, as it renders them slimy on keeping.

TRIOSTEUM. *A.* (*Secondary.*)

TRIOSTEUM PERFOLIATUM. *Bastard Ipecacuanha. Fever Root.*

In very large doses, it sometimes proves emetic. The bark of the root is a good cathartic, in doses of 20 or 30 grains. It sometimes operates as a diuretic.*

TUSSILAGO FARFARA. *E. L. D.*

Colt's Foot. The Herb and Flowers.

This grows wild in moist situations, producing yellow flowers in February and March: these soon fall off, and are succeeded by large roundish leaves, hairy underneath: their taste is herbaceous, somewhat glutinous and subacrid. Tussilago is recommended in coughs, phthisis, and other disorders of the breast and lungs, and some use it in scrofula. It is chiefly directed to be taken with milk, and upon this probably, more than on the tussilago itself, any benefit derived from it in practice is to be explained.

TROCHISCI.—*TROCHES.*

Troches and lozenges are composed of powders made up with glutinous substances into little cakes, and afterwards dried. This form is principally made use of for the more commodious exhibition of certain medicines, by fitting them to dissolve slowly in the mouth,

* Barton's Collections, Part I. p. 28.

so as to pass by degrees into the stomach; and hence these preparations have generally a considerable proportion of sugar or other materials grateful to the palate. Some powders have likewise been reduced into troches, with a view to their preservation; though possibly for no very good reasons; for the moistening, and afterwards drying them in the air, must rather tend to injure than to preserve them. The lozenges of the confectioner are so superior in elegance to those of the apothecary, that they are almost universally preferred; and hence it probably is that the Dublin and London Colleges have entirely omitted them. We regret to see them introduced into the American Pharmacopœia.

TROCHISCI CALCIS CARBONATIS. *A. E.*

Troches of Carbonat of Lime.

Take of
 Carbonat of lime, prepared, . . . four ounces;
 Gum arabic, ... one ounce;
 Nutmeg, ... one drachm;
 Refined sugar, ... six ounces.
Powder them together, and form them with water into a mass for making troches.

These are used against acidity of the stomach, especially when accompanied with diarrhœa.

Trochisci Glycyrrhizæ Glabræ. *E.* *Troches of Liquorice.*

Take of
 Extract of liquorice,
 Gum arabic, each, . . . one part;
 Refined sugar, ... two parts.
Dissolve them in warm water, and strain; then evaporate the solution over a gentle fire, till it be of a proper consistence for being formed into troches.

These are agreeable pectorals, and may be used at pleasure in tickling coughs. The solution, and subsequent evaporation, of the extract of liquorice, directed by the Edinburgh College, is exceedingly troublesome, and apt to give the troches an empyreumatic flavour. They are more easily made, by reducing the liquorice also to powder, and mixing up the whole with rose-water. Refined extract of liquorice should be used; and it is easily powdered in the cold, after it has been laid for some days in a dry and rather warm place.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *A. E.*

Liquorice Troches with Opium.

Take of
Opium, ... two drachms;
Tincture of Tolu, ... half an ounce;
Common syrup, ... eight ounces;
Extract of liquorice, softened in warm water,
Gum arabic, in powder, of each, . . . five ounces.

Triturate the opium well with the tincture, then add by degrees the syrup and extract; afterwards gradually sprinkle upon the mixture the powdered gum arabic. Lastly, dry them so as to form a mass to be made into troches, each weighing ten grains.

These troches are medicines of approved efficacy in tickling coughs depending on an irritation of the fauces. Besides the mechanical effect of the inviscating matters in involving acrid humours, or lining and defending the tender membranes, the opium must no doubt have a considerable share, by more immediately diminishing the irritability of the parts themselves.

Trochisci Gummosi. *E.* *Gum Troches.*

Take of
Gum arabic, ... four parts;
Starch, ... one part;
Double refined sugar, . . . twelve parts.

Powder them, and make them into a proper mass with rose water, so as to form troches.

This composition is a very agreeable pectoral, and may be used at pleasure. It is calculated for allaying the tickling in the throat which provokes coughing.

TROCHISCI MAGNESIÆ. *A.*

Trochisci Carbonatis Magnesiæ. *E.* *Troches of Magnesia.*

Take of
Magnesia, ... four ounces;
Sugar, ... two ounces;
Ginger, in powder, . one scruple.

Rub them together, and with simple syrup form them into a mass fit for making troches.

The Edinburgh College employs the carbonat of magnesia, in quantity the same; and it uses nutmeg in place of ginger.

Trochisci Nitratis Potassæ. *E.* *Troches of Nitrat of Potass.*

Take of
Nitrat of potass, ... one part;
Double refined sugar, . . . three parts.
Rub together to powder, and form them with mucilage of gum tragacanth into a mass, to be divided into troches.

This is a very agreeable form for the exhibition of nitre; though when the salt is thus taken without any liquid, (if the quantity be considerable,) it is apt to occasion uneasiness about the stomach, which can only be prevented by large dilution with aqueous liquors.

U.

ULMUS CAMPESTRIS. *E. L. D.*

Common Elm. The inner Bark.

This tree grows wild in Britain. The inner bark has a yellowish colour, and a mucilaginous, bitter, astringent taste, without smell.

A decoction formed from it, by boiling an ounce with a pound of water, to the consumption of one half, has been highly recommended in the lepra ichthyosis, and has been said to cure dropsies.

ULMUS FULVA. *A.* Ulmus Americana.

Rough-leaved Elm Tree. Red Elm. The inner Bark.

Slippery Elm. The inner Bark.

Four species of elm are enumerated by Nuttall in his *Genera of North American Plants.* It is probable they all partake more or less of the properties which have been noticed in those here mentioned.

The inner bark of the ulmus Americana is said to be esculent. It is useful in pleurisies, &c. and forms an excellent poultice for tumours, and liniment for chaps, &c. It aids the suppuration of gunshot wounds, and is thought superior to the bread and milk and flaxseed poultice. It is highly beneficial in old ulcers and fresh burns, and forms an excellent diet drink in diarrhœa and dysentery.*

We have two species of ulmus or elm in the United States.

* Philadelphia Medical Museum, Vol. II.

The red or *slippery* elm, or American rough-leaved elm of Marshall, (ulmus rubra of Muhlenburgh) on account of its many valuable properties, deserves particular mention. It rises to the height of thirty feet, with a pretty strong trunk, dividing into many branches, and covered with a light coloured rough bark. The leaves are oblong, oval, and sharp pointed, unequally sawed on their edges, unequal at the base, very rough on their upper surface, and hairy underneath. The flowers are produced thick upon the branches, upon short, collected foot stalks, and are succeeded by oval, compressed membranous seed vessels, with entire margins, containing one oval compressed seed. The inner bark, by infusion or gentle boiling in water, affords a great quantity of insipid mucous substance, that is applicable to a variety of important uses. Dr. Mitchell says it has been beneficially administered in catarrhs, pleurisies, and quinsies; it has been applied as a poultice to tumours, and as a liniment to chaps and festers. [Letter to Dr. North, Amer. Museum, vol. 7th.]

The surgeons of our revolutionary army, and also those of general Wayne's army, who defeated the Indians in August 1794, experienced the most happy effects from the application of poultices of the elm bark to gun-shot wounds, which were soon brought to a good suppuration, and to a disposition to heal. It was applied as the first remedy. When tendency to mortification was evident, this bark bruised, and boiled in water, produced the most surprising good effects. After repeated comparative experiments with other emollient applications, as milk and bread, and linseed poultice, its superiority was firmly established. In old ill-conditioned ulcers, and in fresh burns, equal benefit was derived from it. The infusion of the bark was used with advantage as a diet drink, in pleurisy, and catarrh, and also in diarrhœa and dysentery. Many of the above facts relative to the medicinal qualities of the red elm, were communicated, says the editor of the Domestic Encyclopædia, by Dr. Joseph Strong, of Philadelphia, who served as a surgeon in the western army; and adds, as a proof of the nutriment which it affords, that a soldier who lost his way supported himself for ten days upon this mucilage and sassafras. The editor of the above mentioned work, (vol. 2d, p. 448) proceeds to observe, that the red elm tree may be considered as a highly valuable addition to our stock of medicines, exclusively American, and ought to be carefully searched for by the medical gentlemen in the country, and preserved from the indiscriminate ax.

The inner bark of the slippery elm, or its mucilage, has been found by recent experience to be singularly beneficial when applied to chilblains, cutaneous eruptions, and various kinds of sores and ulcers; and there is much reason to believe, that its internal use in dysentery, consumption, &c. may be attended with greater advantage than is generally imagined. This tree certainly may be recommended to the particular regard of medical practitioners as a new, and domestic article of our Materia Medica, whose medicinal virtues will probably be found to merit a large share of confidence.

UVA URSI. *A.* ARBUTUS UVA URSI. *E.*

Bearberry. Wortleberry. Red-berried trailing Arbutus. The Leaves.

This is a very small evergreen shrub. The leaves are oval, not toothed, and their under surface is smooth and pale green. It grows wild in the woods, and on sand hills in Scotland, and in almost every country in Europe. It is also abundant in America. The taste of the leaves is astringent, followed by bitterness. Digested in alcohol they give out a green tincture, which is rendered turbid by water, and when filtered, passes transparent and yellow, while a green resin remains on the filter. They are powerfully astringent, approaching in the deepness of the colour which they give to red sulphat of iron, more nearly to nutgalls than any substance Dr. Duncan tried. Indeed, in some parts of Russia they are used for tanning.

Medical use.—The medical effects of this medicine depend entirely on its astringent and tonic powers. It is therefore useful in various fluxes arising from debility, menorrhagia, fluor albus, cystirrhœa, diabetes, enuresis, diarrhœa, dysentery, &c. It has been strongly recommended in diseases of the urinary organs by De Haen, particularly in ulcerations of the kidneys and bladder. It certainly alleviates the dyspeptic symptoms accompanying nephritic complaints. It is commonly given in the form of powder, in doses of from 20 to 60 grains, three or four times a day.

Dr. Barton thinks it is peculiarly adapted to cases of nephritis depending upon gout, and he says he has known it to be useful even when it was ascertained that a calculus was present. Its use, he thinks, facilitates the expulsion of calculous granules through the urethra. In some cases of nephritis, however, he adds, uva ursi seems to increase the irritation which it so generally relieves.* It has of late been recommended in phthisis.

UNGUENTA.—*OINTMENTS.*

Under this general head may be comprised,

LINIMENTA, - -	*Liniments.*
CERATA, - - -	*Cerates.*
EMPLASTRA, - -	*Plasters.*
UNGUENTA, - - -	*Ointments,* properly so called.

These are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence. Deyeux has, indeed, lately defined plasters to be combinations of oil with metallic oxyds; but as this would comprehend many of our present

* For further observations, see Dr. John S. Mitchell's inaugural dissertation on the Arbutus Uva Ursi, &c. published at Philadelphia, in 1803.

ointments, and exclude many of our plasters, we shall adhere to the old meaning of the terms.

Liniments are the thinnest of these compositions, being only a little thicker than oil. They are generally prepared from oily substances.

Ointments have generally a degree of consistence like that of butter. They are prepared from lard or oil rendered of the consistence of butter by the addition of suet, wax, or spermaceti, so as to suspend the dry powders and more ponderous articles, with which they are frequently incorporated. As they are to be applied to the skin, they should be soft or fluid at the temperature of the body. The following formulæ are calculated for a temperature not exceeding 60° Fahrenheit. In a higher temperature, more suet or wax may be added.

Cerates are firmer, and are composed of oil or lard united with wax or resin, to which various medicaments are frequently added. They should be of such consistence that they may be easily spread on lint or linen, yet not melt or run when applied to the body.

Plasters are the most solid, and derive their firmness either from a large proportion of wax, rosin, &c. or from the presence of some metallic oxyd, such as that of lead.

Plasters should have such a consistence, that when cold they do not adhere to the fingers, but become soft and plastic when gently heated. The heat of the body should render it tenacious enough to adhere to the skin, and to the substance on which it is spread. When prepared, it is usually formed into rolls, and inclosed in paper. Plasters of a small size are often spread on leather, sometimes on strong paper, by means of a spatula gently heated, or the thumb. The leather is cut of the shape wanted, but somewhat larger; and the margin all round, about quarter of an inch in breadth, is left uncovered, for its more easy removal when necessary. Linen is also often used, especially for the less active plasters, which are used as dressings, and often renewed. It is generally cut into long slips of various breadths, from one to six inches. These may either be dipt into the melted plaster, and passed through two pieces of straight and smooth wood, held firmly together, so as to remove any excess of plaster, or, what is more elegant, they are spread on one side only, by stretching the linen, and applying the plaster, which has been melted and allowed to become almost cold, evenly by means of a spatula gently heated, or, more accurately, by passing the linen on which the plaster has been laid, through a machine formed of a spatula, fixed by screws, at a proper distance from a plate of polished steel.

To prevent repetition, the Edinburgh College gives the following canon for the preparation of these substances.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding, at the same time, the dry ingredients, if there be any, until the mixture, on cooling, becomes stiff.

Sevum Præparatum. *L.* Adeps Præparata. *L. D.*

Prepared Suet. Prepared Lard.

Cut them into pieces, and melt them over a slow fire; then separate them from the membranes by straining.

Before proceeding to melt these fats, it is better to separate as much of the membranes as possible, and to wash them in repeated quantities of water until they no longer give out any colour. Over the fire they become perfectly transparent, and if they do not crackle on throwing a few drops into the fire, it is a sign that all the water is evaporated, and that the fats are ready for straining, which should be done through a linen cloth without expression. The residuum may be repeatedly melted with a little water, until it become discoloured with the fire. The fluid fat should be poured into the vessels, or bladders, in which it is to be preserved.

These articles had formerly a place also among the preparations of the Edinburgh College. But now they introduce them only into their list of the Materia Medica; as the apothecary will, in general, find it more for his interest to purchase them thus prepared, than to prepare them for himself; for the process requires to be very cautiously conducted, to prevent the fat from burning or turning black.

Cera Flava Purificata. *D.* *Purified Yellow Wax.*

Take of
Yellow wax, any quantity.
Melt it with a moderate heat, remove the scum, and after allowing it to settle, pour it cautiously off from the fæces.

Yellow wax is so often adulterated, that this process is by no means unnecessary.

LINIMENTA.—*LINIMENTS.*

LINIMENTUM AMMONIÆ. *A.* *Liniment of Ammonia.*

Take of
Water of ammonia,
Olive oil, equal parts. Mix.

LINIMENTUM AMMONIÆ ET ANTIMONII TARTARIZATI. *A.* *Liniment of Ammonia with Tartarized Antimony.*

Take of
Liniment of ammonia, . . . one fluid ounce;
Tartarized antimony, . . . one drachm. Mix.

It is most probable that some decomposition of the tartar emetic ensues in the above preparation.

LINIMENTUM AQUÆ CALCIS. *A. E. D.*

Liniment of Lime Water.

Take of
Flaxseed oil,
Lime water, each equal parts. Mix.

LINIMENTUM CAMPHORATUM. *A. E. D.*

Camphorated Liniment.

Take of
Camphor, reduced to a powder by means of alcohol, half an ounce;
Olive oil, four fluid ounces. Mix.

LINIMENTUM CANTHARIDUM. *A.*

Liniment of Cantharides.

Take of
Cantharides, in powder, . . one ounce;
Oil of turpentine, ... eight fluid ounces.
Simmer for three hours, then set by to cool, and filter.

LINIMENTUM SAPONIS CAMPHORATUM. *A.*

Camphorated Soap Liniment. Opodeldoc.

Take of
Castile soap, uncoloured, in shavings, . . twelve ounces;
Camphor, ... two ounces;
Volatile oil of rosemary, ... two fluid drachms;
Alcohol, ... one gallon.
Digest the soap in the alcohol for three days, then filter, and add the camphor and oil, mixing them intimately.

LINIMENTUM SAPONIS ET OPII. *A.*

Liniment of Soap and Opium. Anodyne Liniment.

Is prepared in the same way, by adding an ounce of opium, and digesting it with the soap and alcohol.

LINIMENTUM TABACI. *Tobacco Liniment.*

Take of
Tobacco, cut fine, . . one ounce;
Hog's lard, ... one pound.
Simmer the tobacco in the lard over a gentle fire, until it becomes crisp, and strain.

LINIMENTUM TEREBINTHINÆ COMPOSITUM. *A.*

LINIMENTUM TEREBINTHINÆ. *L.* (*Compound*) *Turpentine Liniment.*

Take of
Cerate of resin, ... one pound;
Oil of turpentine, ... half a pint.
Add the oil of turpentine to the cerate melted, and mix.

Much used for rubbing parts affected with rheumatic pains, and on sprained joints.

LINIMENTUM SIMPLEX. *E.* *Simple Liniment.*

Take of
Olive oil, ... four parts;
White wax, ... one part.

This consists of the same articles which form the unguentum simplex of the Edinburgh Pharmacopœia, but merely in a different proportion, so as to render the composition thinner; and where a thin consistence is requisite, this may be considered as a very elegant and useful application.

LINIMENTUM HYDRARGYRI. *L.* *Liniment of Mercury.*

Take of
Stronger mercurial ointment,
Prepared lard, of each, ... four ounces;
Camphor, ... one ounce;
Rectified spirit, ... fifteen minims;
Water of ammonia, ... four fluid ounces.
First rub the camphor with the spirit, then with the lard and mercurial ointment; lastly, having gradually added the water of ammonia, mix all the ingredients together.

CERATA.—*CERATES.*

CERATUM ARSENICI. *A.* *Cerate of Arsenic.*

Take of
Simple cerate, ... one ounce;
Arsenious acid, in powder, . . one scruple.
Soften the cerate, and mix in the acid.

A pretty strong preparation.

CERATUM CANTHARIDUM. *A.* CERATUM LYTTÆ. *L.*

Cerate of Cantharides.

Take of
Yellow wax,
Pine resin,
Olive oil, each, ... two parts;
Cantharides, in powder, . . three parts.
To the wax, resin and oil, previously melted together, add the cantharides, carefully stirring the whole until cool.

Under this form cantharides may be made to act to any extent that is requisite. It may supply the place either of the blistering plaster or ointment; and there are cases in which it is preferable to either. It is particularly more convenient than the emplastrum cantharidum, where the skin to which the blister is to be applied, is previously much affected, as in cases of small pox; and in supporting a drain under the form of issue, it is less apt to spread than the softer ointment.

CERATUM JUNIPERI VIRGINIANI. *A.*

Cerate of Red Cedar.

Take of
Resin cerate, ... six parts;
Red cedar, in powder, . . one part.
To the cerate, previously softened, add the cedar, and mix.

CERATUM SABINÆ. *A. L.* *Savin Cerate.*

Take of
Resin cerate, ... six parts;
Savin leaves, in powder, . . one part.
To the cerate, previously softened, add the savin, and mix.

One of the above cerates is at best unnecessary.

CERATUM PLUMBI SUBACETATIS LIQUIDI. *A.*

CERATUM PLUMBI COMPOSITUM. *L.*

Cerate with Subacetat of Lead. Goulard's Cerate.

Take of
- Water of acetated litharge, . . . two ounces and a half;
- Yellow wax, ... four ounces;
- Olive oil, ... nine ounces;
- Camphor, ... half a drachm.

Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as soon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and stir constantly until it be cold; then mix in the camphor previously rubbed with oil.

This application has been rendered famous by the recommendations of Mr. Goulard. It is unquestionably in many cases very useful. It cannot, however, be considered as varying essentially from the saturnine ointments to be mentioned. It is employed with nearly the same intentions, and differs from them chiefly in consistence.

CERATUM PLUMBI SUBCARBONATIS COMPOSITUM. *A.*

Cerate of Subcarbonat of Lead.

Take of
- Compound plaster of subcarbonat of lead, . . five parts;
- Olive oil, ... one part.

To the plaster, previously melted, add the oil, stirring the whole constantly together until cool.

CERATUM RESINOSUM. *A.* CERATUM RESINÆ. *L.*

Resin Cerate.

Take of
- Lard, ... eight parts;
- Pine resin, . . . five parts;
- Yellow wax, . . two parts.

Melt, and stir them together until cool.

CERATUM RESINOSUM COMPOSITUM. *A.*

Compound Resin Cerate.

Take of
- Suet,
- Yellow wax, each, . . . one pound;
- Pine resin, ... one pound;
- Turpentine, ... half a pound;
- Flaxseed oil, ... half a pint.

Melt them together, and strain through linen.

Ceratum Plumbi Superacetatis. *L.*

Cerate of Superacetat of Lead.

Take of
Superacetat of lead, in powder, . . . two drachms;
White wax, ... two ounces;
Olive oil, ... half a pint.

Melt the wax in seven fluid ounces of the oil, and gradually add to these the superacetat of lead, separately triturated with the rest of the oil, and stir the mixture with a wooden spatula until they unite.

These are also excellent cooling ointments, of the greatest use in many cases.

CERATUM SAPONIS. *A. L. D.* *Soap Cerate.*

Take of
Castile soap, ... eight ounces;
Yellow wax, ... ten ounces;
Semi-vitreous oxyd of lead, in powder, . . one pound;
Olive oil, ... a pint;
Vinegar, ... a gallon.

Boil the vinegar with the oxyd of lead, over a slow fire, constantly stirring until the union is complete; then add the soap and boil it again in a similar manner, until the liquid part is evaporated; then mix in the wax, previously melted with the oil.

CERATUM SIMPLEX. *A. E.* Ceratum Cetacei. *L.*

Simple Cerate.

Take of
Olive oil, ... six parts;
White wax, ... three parts;
Spermaceti, ... one part. Melt together.

This differs from the simple ointment, in containing a greater proportion of wax to the oil, and in the addition of the spermaceti. But by these means it obtains only a more firm consistence, without any essential change of properties.

It scarcely differs from the ceratum spermatis ceti of the London and Dublin Colleges, the latter containing one-thirteenth part of spermaceti, and the former one-tenth part; we have therefore introduced one formula only.

The ceratum spermatis ceti had formerly the name of *ceratum album*, and it differs in nothing from the unguentum spermatis ceti, or linimentum album, as it was formerly called, excepting in consistence, both the wax and the spermaceti bearing a greater proportion to the oil.

CERATUM ZINCI CARBONATIS IMPURI. *A. E.*

CERATUM CALAMINÆ. *L.* UNGUENTUM CALAMINARIS. *D.*

Cerate of Impure Carbonat of Zinc. Cerate (Ointment) of Calamine.

CERATUM EPULOTICUM. *Turner's Cerate.*

Take of
Calamine, prepared,
Yellow wax, of each, . . . half a pound;
Olive oil, ... one pint.

Melt the wax with the oil; and as soon as the mixture, exposed to the air, begins to thicken, mix it with the calamine, and stir the cerate until it be cold.

This composition resembles the cerate which Turner strongly recommends in cutaneous ulcerations and excoriations, and which has been usually distinguished by his name. It appears from experience to be an excellent epulotic, and as such is frequently made use of in practice.

EMPLASTRA.—*PLASTERS.*

EMPLASTRUM AMMONIACI. *A. L. E.*

Plaster of Ammoniacum.

Take of
Ammoniacum, . . . five ounces;
Vinegar, ... half a pint.

Dissolve the ammoniacum in the vinegar, and strain; then evaporate the liquor in an iron vessel, by means of a water bath, constantly stirring it until it acquires a proper consistence.

EMPLASTRUM HYDRARGYRI. *A. L. E.*

Plaster of Quicksilver.

Take of
Olive oil,
White resin, each, ... one part;
Quicksilver, ... three parts;
Plaster of semi-vitrified oxyd of lead, ... six parts.

Melt the oil and resin together, and when this mixture is cold, let the quicksilver be rubbed with it till the globules disappear; then add by degrees the litharge plaster, melted, and let the whole be accurately mixed.

Emplastrum Ammoniaci cum Hydrargyro. *L. E.*

Plaster of Gum Ammoniac with Quicksilver.

Take of
Gum ammoniac, strained, . . . one pound;
Purified quicksilver, ... three ounces;
Sulphureted oil, a drachm, or as much as may be necessary.
Triturate the quicksilver with the sulphureted oil, until its globules disappear; then gradually add the gum ammoniac melted, and mix them.

This mercurial plaster is considered as a powerful resolvent, and discutient, acting with much greater certainty for these intentions than any composition of vegetable substances alone; the mercury exerting itself in a considerable degree, and being sometimes introduced into the habit in such quantity as to affect the mouth. Pains in the joints and limbs from a venereal cause, nodes, tophi, and beginning indurations, are said to yield to it sometimes.

Emplastrum Aromaticum. *D.* *Aromatic Plaster.*

Take of
Frankincense, ... three ounces:
Yellow wax, ... half an ounce;
Cinnamon, in powder, ... six drachms;
Essential oil of pimento,
Essential oil of lemon, each, ... two drachms.
Melt the frankincense and wax together, and strain; when getting stiff, from being allowed to cool, mix in the cinnamon and oils, and make a plaster.

EMPLASTRUM ASSAFŒTIDÆ. *A. E.*

Plaster of Assafœtida.

Take of
Plaster of semi-vitrified oxyd of lead,
Assafœtida, each, ... two parts;
Galbanum,
Yellow wax, each, ... one part.

This plaster is applied to the umbilical region, or over the whole abdomen, in hysteric cases; and sometimes with good effect; but probably more from its effects as giving an additional degree of heat to the part, than from any influence derived from the fetid gums.

Emplastrum Calefaciens. *D.* *Calefacient Plaster.*

Take of
Plaster of cantharides, ... one part;
Burgundy pitch, ... seven parts.
Melt together, at a moderate heat, and make into a plaster.

This is a very convenient plaster, being more active as a stimulant and rubefacient than the simple Burgundy pitch plaster, while it will scarcely ever raise a blister.

Emplastrum Ceræ. *L.* *Wax Plaster.*

Take of
Yellow wax,
Prepared mutton suet, each, . . . three pounds;
Yellow resin, ... one pound.
Melt them together, and strain the mixture while it is fluid.

Emplastrum Cumini. *L.* *Cummin Plaster.*

Take of
Cummin seeds,
Caraway seeds,
Bay-berries, each, ... three ounces;
Burgundy pitch, ... three pounds;
Yellow wax, ... three ounces.
Melt the pitch and wax together, and mix with them the rest of the ingredients, powdered, and make a plaster.

This plaster has been recommended as a moderately warm discutient; and is directed by some to be applied to the hypogastric region, for strengthening the viscera, and expelling flatulencies: but it is a matter of great doubt, whether it derives any virtue, either from the article from which it is named, or from the caraway seeds or bay-berries which enter its composition.

Emplastrum Galbani. *D.* *Plaster of Galbanum.*

Take of
Plaster of litharge, ... two pounds;
Galbanum, ... half a pound;
Yellow wax, sliced, ... four ounces.
Add the plaster and wax to the galbanum, melted, and then melt the whole together with a moderate heat.

Emplastrum Galbani Compositum. *L.*

Compound Plaster of Galbanum.

Take of
Strained galbanum, ... eight ounces;
Plaster of lead, ... three pounds;
Turpentine, ... ten drachms;
Frankincense, in powder, ... three ounces.

With the galbanum and turpentine melted together, mix first the frankincense, and afterwards the litharge plaster, melted also with a very slow fire, and make a plaster.

Emplastrum Gummosum. *E.* *Gum Plaster.*

Take of
Plaster of semi-vitrified oxyd of lead, . . . eight parts;
Gum ammoniacum,
Galbanum,
Yellow wax, each, ... one part.

Melt together.

These plasters are used as a digestive and suppurative; particularly in abscesses, after a part of the matter has been maturated and discharged, for suppurating or discussing the remaining hard part; but it is very doubtful whether it derives any advantage from the gums entering its composition.

Emplastrum Ladani Compositum. *L.*

Compound Ladanum Plaster.

Take of
Ladanum, ... three ounces;
Frankincense, ... one ounce;
Cinnamon, powdered,
Expressed oil of mace, of each, . . . half an ounce;
Essential oil of mint, ... one drachm.

To the melted frankincense, add first the ladanum, softened by heat; then the oil of mace. Mix these afterwards with the cinnamon and oil of mint, and beat them together, in a warm mortar, into a plaster. Let it be kept in a close vessel.

This has been considered as a very elegant stomach plaster. It is contrived so as to be easily made occasionally, (for these kinds of compositions, on account of their volatile ingredients, are not fit for keeping,) and to be but moderately adhesive, so as not to offend the skin, and that it may, without difficulty, be frequently renewed; which these sorts of applications, in order to their producing any considerable effect, require to be.

EMPLASTRUM PLUMBI. *A. L.* EMPLASTRUM LITHARGYRI. *D.*

EMPLASTRUM OXYDI PLUMBI SEMIVITREI. *E.*

Lead Plaster. Litharge Plaster.

Plaster of the Semi-vitrified Oxyd of Lead.

Take of
Semi-vitrified oxyd of lead, . . . one part;
Olive oil, ... two parts.

Boil them, adding water, and constantly stirring the mixture, until the oil and litharge be formed into a plaster.

Oxyds of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and which makes a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added, to prevent the plaster from burning, and growing black. Such water, as it may be necessary to add during the boiling, must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator: this accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is, therefore, better to remove it from the fire a little, before each addition of water.

These plasters, which have been long known under the name of Diachylon, are common applications in excoriations of the skin, slight flesh wounds, and the like. They keep the part soft, and somewhat warm, and defend it from the air, which is all that can be expected in these cases, from any plaster.

EMPLASTRUM FERRI. *A.*

EMPLASTRUM OXYDI FERRI RUBRI. *E.*

Plaster of (Red Oxyd of) Lead. Strengthening Plaster.

Take of
Plaster of semi-vitrified oxyd of lead, . . . twenty-four parts;
White resin, ... six parts;
Yellow wax,
Olive oil, each, ... three parts;
Red oxyd of iron, ... eight parts.

Grind the red oxyd of iron with the oil, and then add it to the other ingredients, previously melted.

This plaster is used in weaknesses of the large muscles, as of the loins: and its effects seem to proceed from the artificial mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

EMPLASTRUM PLUMBI SUBCARBONATIS COMPOSITUM. *A.* *Compound Plaster of Subcarbonat of Lead.*

Take of
Subcarbonat of lead, . . one pound;
Olive oil, ... two pints;
Yellow wax, ... four ounces;
Lead plaster, ... one pound and a half;
Orris, in powder, ... nine ounces.

Boil the oil and lead together in a water bath, continually stirring, until they are thoroughly incorporated; then add the wax and plaster; and when these are melted, sprinkle in the powdered orris, carefully stirring the whole.

EMPLASTRUM LITHARGYRI COMPOSITUM. *L.*

Compound Plaster of Litharge.

Take of
Litharge plaster, ... three pounds;
Strained galbanum, . . . eight ounces;
Turpentine, ... ten drachms;
Frankincense, ... three ounces.

The galbanum and turpentine being melted, mix with them the powdered frankincense, and afterwards the litharge plaster, melted also with a very slow fire, and make a plaster.

EMPLASTRUM LITHARGYRI CUM HYDRARGYRO. *L.*

Litharge Plaster with Quicksilver.

Take of
Litharge plaster, ... one pound;
Purified quicksilver, ... three ounces;
Sulphureted oil, ... one drachm, or what is sufficient.

Make the plaster in the same manner as the ammoniacum plaster, with quicksilver.—The observations on which, see.

EMPLASTRUM RESINOSUM. *A. E.*

EMPLASTRUM LITHARGYRI CUM RESINA. *D.* EMPLASTRUM RESINÆ. *L.*

Resin Plaster. Litharge Plaster with Resin. Adhesive Plaster.

Take of
Plaster of semi-vitrified oxyd of lead, . . . five parts;
White resin, ... one part.

Melt them together, and make a plaster.

This plaster is chiefly used as an adhesive for keeping on other

dressings, for retaining the edges of recent wounds together, when we are endeavouring to cure them by the first intention, and for giving mechanical support to new flesh, and contracting the size of ulcers, in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs.

EMPLASTRUM RESINOSUM CANTHARIDUM. *A.*

EMPLASTRUM LYTTÆ. *L.* EMPLASTRUM CANTHARIDIS. *D.*

EMPLASTRUM CANTHARIDIS VESICATORIÆ. *E.*

Resin Plaster with Cantharides. Plaster of Spanish Flies.

Take of
Mutton suet,
Yellow wax,
White resin,
Cantharides, each, equal weights.

Mix the cantharides, reduced to a fine powder, with the other ingredients, previously melted, and removed from the fire.

This formula is very well suited to answer the intention in view, that of exciting blisters; for it is of a proper consistence and sufficient degree of tenacity, which are here the only requisites. Cantharides of good quality, duly applied to the skin, seldom fail of producing blisters. When, therefore, the desired effect does not take place, it is to be ascribed to the flies either being faulty at first, or having their activity afterwards destroyed by some accidental circumstance; such as too great heat in forming, or in spreading the plaster, or the like. It is, therefore, not unusual, to sprinkle powder of cantharides on the blister, after it is spread.

EMPLASTRUM CANTHARIDIS VESICATORII COMPOSITUM. *E.*

Compound Plaster of Spanish Flies.

Take of
Venice turpentine, ... eighteen parts;
Burgundy pitch,
Cantharides, each, ... twelve parts;
Yellow wax, ... four parts;
Sub-acetat of copper, . . . two parts;
Mustard seed,
Black pepper, each, ... one part.

Having first melted the pitch and wax, add the turpentine, and to these, in fusion, and still hot, add the other ingredients, reduced to a fine powder and mixed, and stir the whole carefully together, so as to form a plaster.

This is supposed to be the most infallible blistering plaster. It certainly contains a sufficient variety of stimulating ingredients.

Emplastrum Picis Compositum. *L.*

Compound Burgundy Pitch Plaster.

Take of
Burgundy pitch, ... two pounds;
Galbanum, ... one pound;
Yellow resin,
Yellow wax, of each, . . . four ounces;
Expressed oil of mace, . . . one ounce.

To the pitch, resin, and wax, melted together, add first the galbanum, and then the oil of mace.

Emplastrum Saponaceum. *E.* *Soap Plaster.*

Take of
Soap, ... one part;
Litharge plaster, . . . six parts.

Mix the soap with the melted litharge plaster, and boil them to the thickness of a plaster.

This plaster has been supposed to derive a resolvent power from the soap; but it is a matter of great doubt, whether it derives any material advantage from the addition.

Emplastrum Simplex. *E.* *Simple Plaster.*

Take of
Yellow wax, ... three parts;
Mutton suet,
White resin, each, . . . two parts.

This plaster had formerly the title of *Emplastrum Attrahens,* and was chiefly employed as a dressing after blisters, to support some discharge, and it is a very well contrived plaster for that purpose. Sometimes, however, it irritates too much on account of the resin; and hence, when designed only for dressing blisters, the resin ought to be entirely omitted, unless where a continuance of the pain and irritation, excited by the vesicatory, is required. Indeed, plasters of any kind are not very proper for dressing blisters; their consistence makes them sit uneasy, and their adhesiveness renders the taking them off, painful. Cerates, which are softer and less adhesive, appear much more eligible: the Ceratum spermatis ceti will serve for general use; and for some particular purposes, the Ceratum resinæ flavæ may be applied.

Emplastrum Thuris Compositum. *L.*

Compound Frankincense Plaster.

Take of
 Frankincense, ... half a pound;
 Dragon's blood, ... three ounces;
 Litharge plaster, . . . two pounds.
To the melted litharge plaster, add the rest, powdered.

It has been supposed, that plasters composed of styptic medicines constringe, and strengthen the part to which they are applied, but on no very just foundation; for plasters in general relax rather than astringe; the unctuous ingredients necessary in their composition, counteracting and destroying the effect of the others.

If constantly worn with a proper bandage, it will, in children, frequently do service, though, perhaps, not so much from any strengthening quality of the ingredients, as from its being a soft, close, and adhesive, covering.

UNGUENTA.—*OINTMENTS.*

UNGUENTUM ACIDI NITROSI. *A. E.*

Ointment of Nitrous Acid.

Take of
 Hog's lard, ... one pound;
 Nitrous acid, . . . six drachms.
Mix the acid gradually with the melted lard, and diligently beat the mixture as it cools.

The axunge in this ointment seems to be oxydized; for during the action of the acid upon it, there is a great deal of nitric oxyd gas disengaged. It acquires a yellowish colour, and a firm consistency; and forms an excellent and cheap substitute, in slight herpetic and other cutaneous affections, for the ointment of nitrat of mercury.

Unguentum Adipis Suillæ. *L.* Unguentum Aquæ Rosæ. *A.!!*

Ointment of Hog's Lard. Ointment of Rose Water.

Take of
 Prepared hog's lard, . . . two pounds;
 Rose water, ... three ounces.
Beat the lard with the rose water until they be mixed; then melt the mixture with a slow fire, and set it apart that the water may subside; after which, pour off the lard from the water, constantly stirring it until it be cold.

In the last edition of the London Pharmacopœia, this was styled *Unguentum Simplex;* the name given by the Edinburgh College to the following preparation.

UNGUENTUM SIMPLEX. *E.* *Simple Ointment.*

Take of
Olive oil, ... five parts;
White wax, . . two parts.

Both these ointments may be used for softening the skin and healing chaps. The last is, however, preferable, as being more steadily of one uniform consistence. For the same reason it is also to be preferred as the basis of other more compounded ointments.

Why the American Pharmacopœia should have designated their ointment with the name of *ointment of rose water,* when it is conspicuous that little, if any of the water remains, would be impossible to say; it is only a more *refined* mode of making a simple lip-salve.

UNGUENTUM CERÆ FLAVÆ. *D.* *Ointment of Yellow Wax.*

Take of
Purified yellow wax, . . a pound;
Prepared hog's lard, . . four pounds.
Make into an ointment.

UNGUENTUM CERÆ ALBÆ. *D.* *Ointment of White Wax.*

Is prepared in the same manner, with white wax, instead of yellow.

UNGUENTUM SPERMATIS CETI. *D.* *Ointment of Spermaceti.*

Take of
Spermaceti, ... one pound;
White wax, ... half a pound;
Prepared hog's lard, . . . three pounds.
Make into an ointment.

This had formerly the name of *Linimentum album,* and it is perhaps only in consistence that it can be considered as differing from the unguentum simplex, or the ceratum simplex, already mentioned.

UNGUENTUM CANTHARIDUM. *A. D.* UNGUENTUM LYTTÆ. *L.*

Ointment of Cantharides or Spanish Flies.

Take of
Spanish flies, powdered, . . . two ounces;
Distilled water, ... eight ounces;
Ointment of yellow resin, . . eight ounces.
Boil the water with the Spanish flies to one half, and strain. To the strained liquor add the ointment of yellow resin. Evaporate this mixture to the thickness of an ointment in a water-bath, saturated with sea-salt.

UNGUENTUM INFUSI CANTHARIDIS VESICATORII. *E.*

Ointment of Infusion of Cantharides.

Take of
Cantharides,
Pine resin,
Yellow wax, each, ... one part;
Hog's lard,
Venice turpentine, each, . . two parts;
Boiling water, ... four parts.
Infuse the cantharides in the water for a night; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed; then add the resin and wax; and when these are melted, take the ointment off the fire and add the turpentine.

These ointments, containing the soluble parts of the cantharides, uniformly blended with the other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in substance. This, however, does not uniformly hold, and accordingly the Edinburgh College, with propriety, introduce the following.

UNGUENTUM PULVERIS CANTHARIDIS VESICATORII. *E.*

Ointment of the Powder of Spanish Flies.

Take of
Resinous ointment, ... seven parts;
Powdered cantharides, . . . one part.

This ointment is employed in the dressings for blisters, intended to be made *perpetual*, as they are called, or to be kept running for a considerable time, which in many chronic, and some acute cases, is of great service. Particular care should be taken, that the cantharides employed in these compositions be reduced into very subtile powder, and that the mixtures be made as equal and uniform as possible.

UNGUENTUM CUPRI SUBACETATIS. *A. E.*

UNGUENTUM ÆRUGINIS. *D.* *Ointment of the Subacetat of Copper.*

Take of
  Simple ointment, ... fifteen parts;
  Prepared subacetat of copper, in powder, . . one part.
Melt the ointment, then add the copper, and mix them together.

UNGUENTUM GALLARUM. *A.* *Ointment of Galls.*

Take of
  Galls, in powder, . . . one drachm;
  Lard, ... seven drachms.
Mix the powdered galls with the lard previously melted.

UNGUENTUM ELEMI. *D.* UNGUENTUM ELEMI COMPOSITUM. *L.*

Compound Ointment of Elemi.

Take of
  Elemi, ... one pound;
  Turpentine, ... ten ounces;
  Mutton suet, prepared, . . . two pounds;
  Olive oil, . . , ... two ounces.
Melt the elemi with the suet; and having removed it from the fire, mix it immediately with the turpentine and oil; after which strain the mixture.

This ointment, formerly known by the name of *Linimentum Arcæi,* has long been used for digesting, cleansing, and incarnating; and for these purposes is preferred by some surgeons to all the other compositions of this kind, probably because it is more expensive.

UNGUENTUM HELLEBORI ALBI. *L. D.* *Ointment of White Hellebore.*

Take of
  White Hellebore, . . . one ounce;
  Hog's lard, ... four ounces;
  Essence of lemon, . . . half a scruple.
Mix, and make them into an ointment.

White hellebore externally applied has long been celebrated in the cure of cutaneous diseases.

UNGUENTUM HYDRARGYRI. *A. E. D.*

Unguentum Hydrargyri Fortius. *L.*

Mercurial Ointment. Stronger Mercurial Ointment.

Take of
Purified mercury,
Lard, each, . . . three parts by weight;
Suet, ... one part.
Rub the quicksilver carefully in a mortar with a small portion of the lard,* until the globules disappear; then add the remainder of the lard and the suet, rubbing them well together.

Unguentum Hydrargyri Mitius. *L.*

Milder Mercurial Ointment.

Take of
The stronger ointment of quicksilver, . . . one part;
Hog's lard, prepared, ... two parts.
Mix them.

UNGUENTUM HYDRARGYRI OXYDI CINEREI. *A. E.*

Ointment of Grey Oxyd of Mercury.

Take of
Grey oxyd of quicksilver, . . . one part;
Hog's lard, ... three parts. Mix.

These ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active state into the circulating system: which may be effected by gentle friction on the sound skin of any part, particularly on the inside of the thighs or legs. For this purpose, these simple ointments are much better suited than the more compounded ones with turpentine and the like, formerly employed. For, by any acrid substance, topical inflammation is apt to be excited, preventing further friction, and giving much uneasiness. To avoid this, it is necessary, even with the mildest and weakest ointment, to change occasionally the place at which the friction is performed.

It is requisite that the ointments, in which the mercury is extinguished by trituration, should be prepared with very great care: for upon the degree of triture which has been employed, the activity of the mercury very much depends. The addition of the mutton suet,

* Employing a small portion of old ointment or rancid lard, greatly expedites the process.

adopted by the Colleges of London and Edinburgh, is an advantage to the ointment, as it prevents it from running into the state of oil, which the hog's lard alone, in warm weather, or in a warm chamber, is sometimes apt to do, and which is followed by a separation of parts. We are even inclined to think, that the proportion of suet directed by the London College is too small for this purpose, and indeed seems to be principally intended for the more effectual triture of the mercury: but it is much more to be regretted, than in a medicine of such activity, the colleges should not have directed the same proportion of mercury to the fatty matter.

UNGUENTUM HYDRARGYRI SUBMURIATIS AMMONIATI. *A. D.*

UNGUENTUM HYDRARGYRI PRÆCIPITATI ALBI. *L.*

Ointment of Ammoniated Submuriat of Mercury.

Ointment of White Precipitated Quicksilver.

Take of
White precipitated quicksilver, . . . one drachm;
Prepared lard, ... one ounce and a half.
Add the precipitated quicksilver to the lard, melted with a slow fire, and mix.

This is a very elegant mercurial ointment, and frequently made use of in the cure of obstinate cutaneous affections.

Although this is a very useful preparation, yet it frequently fails; an ointment recommended, we believe, first by Mr. Ring of London, consisting of thirty grains of white precipitate, and ten grains of corrosive sublimate, to the ounce of lard, we have often found effectual, when the other had altogether proved ineffectual.

UNGUENTUM HYDRARGYRI NITRICO-OXYDI. *A. L.*

Ointment of Nitric-Oxyd of Quicksilver.

UNGUENTUM OXYDI HYDRARGYRI RUBRI. *E.*

Ointment of Red Oxyd of Quicksilver.

UNGUENTUM SUBNITRATIS HYDRARGYRI. *D.*

Ointment of Subnitrat of Quicksilver.

Take of
Red oxyd of quicksilver by nitrous acid, . . . one part;
Hog's lard, ... eight parts.

The oxyd should be reduced to a very fine powder before it be added to the axunge. This is an excellent stimulating ointment, often of very great service in indolent ill-conditioned sores, when we wish to excite them to greater action. As an eye-ointment, its

effects are most remarkable, in the cure of all inflammations of the tunica conjunctiva, and more particularly when there is a thickening and swelling of the inner membrane of the palpebræ. In such cases, it seems to act with much greater certainty, if applied immediately after the eyelids have been scarified. In inflammation, accompanied with specks, it has a most powerful effect in removing both. It is also useful in all those ophthalmias which so frequently appear after small-pox, measles, and eruptive diseases of the hairy scalp. It is used in the same quantity, and in the same manner as the Unguentum nitratis hydrargyri; and if it prove too stimulating, it may be diluted with axunge. It is useful to know that if it be mixed with any ointment containing resin, the red oxyd is very quickly converted into the black, and the ointment gradually loses its red colour, and passes through olive-green to black.

UNGUENTUM HYDRARGYRI NITRATIS FORTIUS. *A. E.*

Ointment of Nitrat of Mercury.

UNGUENTUM SUPERNITRATIS HYDRARGYRI. *D.*

Ointment of Supernitrat of Quicksilver.

UNGUENTUM HYDRARGYRI NITRATIS. *L.* UNGUENTUM CITRINUM.

Ointment of Nitrat of Quicksilver. Yellow (Citrine) Ointment.

Take of

Purified mercury, by weight, . . . one part;
Nitric acid, ... two parts;
Olive oil, ... nine parts;
Lard, ... three parts.

Dissolve the mercury in the acid, then mix the liquor with the oil and lard previously melted together, and just beginning to grow stiff. Stir them briskly together in a glass mortar, so as to form an ointment.

UNGUENTUM HYDRARGYRI NITRATIS MITIUS. *A. E.*

Milder Ointment of Nitrat of Mercury.

This is prepared in the same way, with three times the quantity of hog's lard.

This ointment, when prepared with lard alone, soon becomes so very hard, that it is necessary to mix it with fresh axunge before it can be used. The substitution of olive oil for part of the axunge obviates, in a great measure, this inconvenience. The hardening is entirely owing to the excess of the acid in the solution of mercury. Hence the London College have acted in 1809 very inconsiderately in increasing the quantity of nitrous acid, from two ounces by weight to two fluid ounces, which caused, as Mr. Phillips found, vio-

lent action, and the evolution of much noxious vapour, when the solution of mercury is mixed with the axunge, and renders the ointment extremely corrosive. They have in 1815 corrected this error: but the property which nitrat of mercury, prepared by ebullition, has, of being decomposed by water, furnished an easy way of getting rid of all excess of acid, and of procuring the subnitrat of mercury in the state of the most minute division possible. An ointment, prepared with this subnitrat, had a most beautiful golden colour; after six months was perfectly soft; and had all the properties desired.

When the citrine ointment is too hard, it should be softened by triturating it with lard or oil; for, if melted with them, it very soon hardens again.

Medical use.—This ointment has the very best effects in herpes, tinea capitis, and similar obstinate cutaneous affections, and it is almost specific in psorophthalmia, in those slight excoriations of the tarsi, attended with extreme itching, and in all the inflammations of the eyes, attended by eruptive disorders of the hairy scalp or face. It is most conveniently and effectually used, by rubbing a piece of the size of half a garden pea, with the point of a hair pencil, over the tarsi, among the roots of the ciliæ, and allowing a small quantity to get on the inner membrane of the palpebræ. In obstinate cases, a weak solution of muriat of mercury, used as a collyrium along with this ointment, proves a most powerful remedy.

UNGUENTUM PICIS LIQUIDÆ. *A. L. D. E.*

Tar Ointment.

Take of
Tar, ... five parts;
Yellow wax, . . two parts.
Mix them together, and strain through linen.

This composition, from the empyreumatic oil and saline matters the tar contains, is undoubtedly of some activity. Accordingly, it has been successfully employed against some cutaneous affections, particularly tinea capitis.

UNGUENTUM PLUMBI SUBCARBONATIS. *A.*

UNGUENTUM CARBONATIS PLUMBI. *E.* UNGUENTUM CERUSSÆ. *D.*

Ointment of Subcarbonat of Lead.

Take of
Simple ointment, ... one pound;
Subcarbonat of lead, . . . two ounces.
To the ointment, previously softened, add the lead, and stir them until cool.

UNGUENTUM STRAMONII. *A.* *Ointment of Thorn Apple.*

Take of
Thorn apple leaves, fresh gathered and sliced, . five pounds;
Lard, ... fourteen pounds.
Let them simmer together over a gentle fire till the leaves become crisp and dry, then press out the lard through a linen cloth, and add to every pound of the compound, of
Yellow wax, ... two ounces.
When the wax is melted, let the whole be allowed to cool gradually, that the impurities may subside, which must be separated from the ointment.

UNGUENTUM SULPHURIS. *A. E. L. D.* *Sulphur Ointment.*

Take of
Hog's lard, ... four parts;
Sublimed sulphur, ... one part.
To each pound of this ointment may be added,
Volatile oil of lemons, or
Volatile oil of lavender, ... half a drachm.

Sulphur is a certain remedy for the itch, more safe than mercury. A pound of ointment serves for four unctions. The patient is to be rubbed every night, a fourth part of the body at each time. Though the disease may be thus cured by a single application, it is in general advisable to touch the parts most affected for a few nights longer, and to conjoin with the frictions the internal use of sulphur.

UNGUENTUM SULPHURIS COMPOSITUM. *A. L.*

Compound Sulphur Ointment.

Take of
Sulphur, ... one ounce;
Ammoniated submuriat of mercury,
Benzoic acid, each, ... one drachm;
Oil of lemons, ... one fluid drachm;
Sulphuric acid, ... sixty minims;
Nitrat of potass, ... two drachms;
Lard, ... half a pound.
Melt the lard, then add the other articles, continually stirring, until the whole is cold.

We cannot admire the present formula; some decomposition, we apprehend, must ensue by the action of the sulphuric acid on the nitrat of potash. It may, however, be useful, by the conjunction of the nitric acid thereby liberated, if indeed the oils do not decompose it also.

UNGUENTUM ZINCI OXYDI IMPURI. *A. E.*

UNGUENTUM TUTIÆ. *D.*

Ointment of Impure Oxyd of Zinc. Ointment of Tutty.

Take of
  Lard, ... five parts;
  Prepared impure oxyd of zinc, . . . one part.
To the melted lard add the zinc, and mix them together until cool.

UNGUENTUM OXYDI ZINCI. *E. D.* UNGUENTUM ZINCI. *L.*

Ointment of Oxyd of Zinc.

Take of
  Lard, ... six parts;
  Oxyd of zinc, ... one part.

These ointments are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

UNGUENTUM VERATRI VIRIDIS. *A.*

Ointment of American Hellebore.

Take of
  American hellebore, in powder, . . . two ounces;
  Lard, ... eight ounces;
  Oil of lemons, ... twenty minims.
To the lard, previously melted, add the oil and powder, continually stirring until cool.
In the same manner the ointment may be prepared of the white hellebore.

UNGUENTUM PIPERIS NIGRI. *D.* *Ointment of Black Pepper.*

Take of
  Prepared lard, ... one pound;
  Black pepper, in powder, . . . four ounces.
Make into an ointment.

This is stimulating and irritating.

UNGUENTUM RESINOSUM. *E.* *Resinous Ointment.*

Take of
  Hog's lard, ... eight parts;
  White resin, ... five parts;
  Yellow wax, ... two parts.

This is commonly employed in dressings, for digesting, cleansing, and incarnating, wounds and ulcers. The addition of spirits of turpentine to this ointment, so as to give it the consistence of a liniment, forms the application employed by Mr. Kentish, to burns, &c.

UNGUENTUM SABINÆ. *D.* *Savine Ointment.*

Take of
- Fresh savine leaves, separated from the stalks, and bruised, half a pound;
- Prepared hog's lard, ... two pounds;
- Yellow wax, ... half a pound.

Boil the leaves in the lard until they become crisp; then filter with expression: lastly, add the wax, and melt them together.

This is an excellent issue ointment, being, in many respects, preferable to those of cantharides.

UNGUENTUM SAMBUCI. *L.* *Elder Ointment.*

Take of
- Elder flowers, ... four pounds;
- Mutton suet, prepared, ... three pounds;
- Olive oil, ... one pint.

Boil the flowers in the suet and oil, till they be almost crisp; then strain with expression.

Compositions of this kind were formerly very frequent; but vegetables, by boiling in oils, impart to them nothing but a little mucilage, which changes the greasy oils to drying oils, and any resin they may contain; but that also is never in such quantity as to affect the nature of the oil. We, therefore, do not suppose that this ointment possesses any properties different from a simple ointment of the same consistency.

V.

VALERIANA. *A.*

VALERIANA OFFICINALIS. *E. D.* VALERIANA SYLVESTRIS. *L.*

Wild Valerian. The Root.

This plant is perennial, and grows wild in Britain. It varies in its appearance and sensible qualities, according to the situation in which it grows. In marshes and shadowy places its leaves are broader than on dry heaths and high pastures. The roots produced in low watery grounds, have a remarkably faint smell in comparison of the others, and sometimes scarcely any. The roots, in autumn or winter, have much stronger sensible qualities than those collected in spring and summer. The root consists of a number of strings or fibres matted together, issuing from one common head, of a whitish or pale brownish colour: its smell is strong, like a mixture of aromatics with fetids; the taste unpleasantly warm, bitterish, and sub-acrid. Neumann got from 480 grains of the dry root, 186 alcoholic, and 74 watery extract; and inversely, 261 watery and 5 alcoholic. The distilled alcohol was slightly, the water strongly impregnated with the smell of the valerian, but no separable oil was obtained.

Medical use.—Wild valerian is a medicine of great use in nervous disorders, and is particularly serviceable in epilepsies proceeding from a debility of the nervous system.

Some recommend it as useful in procuring sleep, particularly in fever, even when opium fails: but it is principally useful in affections of the hysterical kind.

The common dose is from a scruple to a drachm in powder: and in infusion, from one to two drachms. Its unpleasant flavour is most effectually concealed by a suitable addition of mace.

As its virtues reside entirely in an essential oil, the decoction and watery extract are improper forms for exhibiting it.

A writer in the London Medical Museum asserts, that much of the powerful smell of valerian, arises from the careless manner in which it is dried—by which cats, who greatly enjoy the plant, are often enabled to urine over it.

VERATRUM ALBUM. *A. E. L. D.* HELLEBORUS ALBUS.

White Hellebore. The Root.

This plant grows spontaneously in Switzerland, and the mountainous parts of Germany. The root has a nauseous, bitterish, acrid taste, burning the mouth and fauces: if wounded when fresh, it emits an extremely acrimonious juice, which, when inserted into a wound, is

said to prove very dangerous. Neumann got from 960 grains, 560 watery, and 10 alcoholic extract; and inversely, 420 alcoholic, and 180 watery. Nothing rose in distillation.

This perennial plant grows in wet meadows, and swampy places, often locally associated with scunk cabbage, which, early in the spring season, it considerably resembles in appearance; the latter plant, however, has no stalk, while the hellebore sends forth one, which attains to the height of two or three feet, terminating in June, in a spike of flowers and seeds. The leaves are large and handsomely plaited. The root is bulbous, and when fresh, has a nauseous, bitterish, acrid taste, burning the mouth and fauces. Snuffed up the nostrils in very small quantities, it excites violent sneezing, with a sense of heat, and a copious discharge of mucus. The fresh root, in form of ointment or decoction, cures the itch. Crows are destroyed by boiling Indian corn in a strong decoction of the roots, and strewing it on the ground where these birds resort. The root, when dried, has no particular smell, but a durable, nauseous, and bitter taste, and when powdered, and applied to issues or ulcers, is said to produce griping, and purging. Taken internally, it acts with extreme violence as an emetic and cathartic, and even in a small dose, has occasioned spasms, convulsions, and fatal consequences. The ancients sometimes employed this as a remedy, in obstinate maniacal cases, and it is said, with success; but it has scarcely been regarded in modern practice. The American species, very probably, possesses all the properties of the foreign officinal root. It is undoubtedly, a plant of highly active powers, meriting a particular investigation, as an article of our Materia Medica. In fact, a new interest has lately been excited both in Europe and the United States, relative to the properties of white hellebore. It is even supposed to be the basis of the French specific remedy, called *Eau Medicinale d'Husson,* so highly famed for its almost infallible powers in the cure of gout, as to command the enormous price of from one to two crowns a dose. This remedy was discovered about forty years ago, by M. Husson, a French officer, who affirms it to be prepared from a plant, whose virtues were before unknown in medicine; and it has long been celebrated in France, and other parts of the European continent.

Dr. Edwin G. Jones, member of the Royal College of Physicians, London, after a thorough investigation of the subject, has, in a late publication, adduced the most unequivocal evidence, of the superior powers of the *Eau Medicinale,* in curing the most distressing paroxysms of gout. His experience of its efficacy has been extensive, and among the numerous and remarkable instances to which he refers, are persons of distinguished rank and respectability, and whose cases were marked with symptoms of extreme severity. We have, therefore, the authority of Dr. Jones to assert, that this singular remedy exerts an extraordinary influence over the gout; and that it will safely, and almost immediaetly remove, often by a single dose, the severest paroxysms of that cruel disease, is sufficiently ascertained by a multitude of facts, collected from various sources of unques-

tionable authenticity. Scarcely an instance of its failure, has yet been known to occur in practice. It is not, however, asserted, that it performs a radical cure of gout, eliminating the disease altogether from the system, but its operation is different from that of any remedy hitherto employed, it removes the paroxysms as often, and almost as soon as they occur. It in fact, relieves the patient from agonizing pain, from all the miseries of long confinement, and restores him to his usual state of health, and the exercise of his limbs. It appears to be a powerful sedative, diminishing almost immediately, the irritability of the system. Hence it allays pain, procures rest and sleep, reduces the pulse, and abates fever.

This remedy has been extended to other diseases, and in several cases, it has removed very acute rheumatisms, in the same singular manner it does the gout.—The full dose of this medicine, according to Husson, and Dr. Jones, is about two drachms for an adult, mixed with an equal quantity of water, and taken on an empty stomach. Its operation may be promoted by some aromatic, or by peppermint, pennyroyal, or ginger teas. It in general occasions some nausea and vomiting, followed by bilious stools. A single dose will often carry off an attack, but it sometimes requires to be repeated in under doses.* Some instances are recorded of its violent effects, when exhibited in a dose disproportionate to the constitution, and particular circumstances. On some occasions, much advantage has been derived from small doses taken every day for a considerable time.

The discovery of the substance from which this remedy is prepared, would be an invaluable acquisition to our Materia Medica. The importance, and popularity of the subject, were incitements to various attempts for that purpose, and to the ingenuity of Mr. J. Moor, member of the Royal College of Surgeons, London, the public are indebted for the composition, which, if not identically the same, bears a strong resemblance to the *Eau Medicinale* in smell, taste, and dose; and also in all its effects, so far as it has been tried, in the cure of gout. The composition of Mr. Moor consists of wine of opium (Sydenham,) one part; wine of white hellebore, three parts, made by infusing, for ten days, eight ounces of the sliced root of

* *Extracts of Letters from a sufferer from Gout.—In proof of the efficacy of the Eau Medicinale.*

Mr. ——— was perfectly right, when he told me, that I would give him any price for a bottle of his *Eau Medicinale*, when I had the gout.—I have been tormented with it all this week, and have it now in my two feet, so as to be unable to stand on them.—If Mr ——— will have the goodness to spare me one bottle, he will infinitely oblige a distracted and suffering brother, who is his very obedient servant.

Dear Sir.—I have this moment received your polite note of yesterday, and thank you cordially for your kind intention of even taking from your stock of *Eau Medicinale*, one bottle for me.—As you expected, I got one at Mr. Marshall's, on Saturday evening, and took one half of it, by which I was pretty well at ease on Sunday morning; I took the remainder in the evening, and on Monday was almost free from pain, and could walk in my room, when I had the honor of a visit from your friend Major ———, who found me, I may say, very well; and was it not for the rainy weather, I could, without any difficulty or inconvenience, being entirely free from swelling and pain, have carried this note myself to Mr. ———, who, I hope, will be so obliging as to forward it to you, &c. &c.

that plant, in two and a half pints of white wine, and strained through paper. This compound, when exhibited in doses of from one to two drachms, has, in a variety of instances, effected a speedy cure of gouty paroxysms. There are, indeed, well attested examples, where the most painful gouty affection, has yielded to a single dose of about one drachm, and the instances of its failure have hitherto, it is believed, been more rare than can be said of any other remedy. The employment of the composition of Mr. Moor, has also, in the hands of respectable physicians, been extended to acute rheumatism, and to some comatose affections, with the most decided advantage, and a perseverance in similar trials is strongly recommended. It has been observed, that beneficial effects may more certainly be expected, when it excites some degree of nausea and vomiting, which an overdose like *Eau Medicinale* seldom fails to induce.

We have hitherto been furnished with the additional evidence of every day's experience, of the efficacy of Mr. Moor's composition, in the cure of both gout and rheumatism; and no circumstance, it is believed, has yet occurred, tending to impair our faith in the analogy of its principles with the original preparation of M. Husson. Farther particulars respecting the character and properties of this interesting article, and the most eligible modes of preparation, are anxiously anticipated.

It has lately been discovered, that the root of white hellebore is employed as a valuable article in a new process for tanning leather. It is now generally supposed that the Colchicum is the base of this preparation.

VERATRUM VIRIDE. *A.*

American Hellebore. The Root.

VERONICA BECCABUNGA. *D.* *Brooklime. The Herb.*

This is a low perennial plant, common in little rivulets, and ditches of standing water. The leaves remain all the winter, but are in greatest perfection in the spring. Their prevailing taste is an herbaceous one, accompanied with a very light bitterness.

If any good effects be expected from brooklime, it should be used as food.

VERONICA. *A.* (*Secondary.*) *Veronica. The Root.*

This is the root of the Veronica Virginica; of its virtues we know nothing.

VIOLA ODORATA. *E. D.* *Sweet Violet.* *The recent Flowers.*

This plant is perennial, and is found wild under hedges and in shady places; but the shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour, and their peculiar richness of colour, that they have given a name to both.

In our markets we meet with the flowers of other species; these may be distinguished from the foregoing by their being larger, of a pale colour, and of no smell.

Medical use.—They impart their colour and flavour to aqueous liquors: a syrup made from this infusion has long maintained a place in the shops, and is said to be an agreeable and useful laxative for children, but is chiefly valued as a delicate test of the presence of uncombined acids or alkalies, the former changing its blue to a red, and the latter to a green colour.

VIOLA. *A.* (*Secondary.*) VIOLA PEDATA.
Violet. *The Plant.*

VITIS VINIFERA. *E. L. D.*

The Vine. Grapes. Raisins. Wine. Tartar. Crystals of Tartar. Vinegar.

The vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable sub-acid fruit. Before they are ripe, grapes are extremely harsh and acid, and by expression furnish a liquor which is called verjuice. It contains malic acid, super-tartrat of potass, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar increases, while that of malic acid diminishes: it however never disappears entirely. When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptic, and nutritious; and, when eaten in considerable quantity, diuretic, and gently laxative. In inflammatory diseases, and all others where acids are indicated, they form an excellent article of diet.

UVÆ. *A. E. L. D.* *Raisins.* *The dried Fruit of the Vine.*

Raisins are grapes which have been carefully dried. By this means not only the water they contained is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

VINUM. *A. E. L. D.*

Wine. Teneriffe. A. Sherry. E. L.

Wine is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of sugar be too large, part of it remains undecomposed, as the fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it be too small, the wine is thin and weak; and if it be bottled before the fermentation be completed, it will proceed slowly in the bottle, and, on drawing the cork, the wine will froth and sparkle in the glass, as for example, champaigne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour: these are called white wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured: such are called red wines. Besides in these principal circumstances, wines vary very much in flavour. The red wines most commonly drunk in Great Britain are Port, which is strong and austere, containing much tannin; and Claret, which is thinner and higher flavoured. The white wines are all strong, Madeira, Sherry, Lisbon, Malaga, and Hock. Of these the last is the most acidulous, and Malaga the sweetest.

The following Tables exhibit a comparative view of the contents of different Wines and Spirituous Liquors. The first is taken from Mr. Brande's paper in Phil. Trans. vol. 101. *The second is from Neumann.*

	Strongest.	Medium.	Weakest.
Rum,		53 68	
Brandy,		53.39	
Hollands,		51.60	
Raisin wine,		25.77	
Port,	25.83	23.49	21.40
Madeira,	24.42	22.27	19.34
Marsala,	25.87	21.56	17.26
Currant wine,		20.55	
Constantia,		19.75	
Sherry,	19.83	19.17	18.25
Lisbon,		18.94	
Bucellas,		18 49	
Red Madeira,		18.40	
Cape muscat,		18.25	
—— madeira,		18.11	
Grape wine,		18.11	
Calcavalla,		18.10	
White hermitage,		17.43	
Rousillon,		17 26	
Malaga,		17.26	

	Strongest.	Medium.	Weakest.
Malmsey mad,		16.40	
Sheruaz,		15.52	
Syracuse,		15.28	
Nice,		14.63	
Claret,	16.32	14.44	12.91
Tent,		13.30	
Burgundy,	14.53	13.24	11.95
White Champaigne,		12.80	
Vin de Grave,		12.80	
Frontignac,		12.79	
Cote roti,		12.32	
Red hermitage,		12.32	
Gooseberry wine,		11.84	
Hock,	14.37	11.62	8.88
Tokay,		9.88	
Elder wine,		9.87	
Cyder,		9 87	
Perry,		9.87	
Ale,		8.88	
Brown stout,		6.80	

The first column in this Table shows the quantity of rectified spirit ; the second that of thick, oily, unctuous, resinous matter ; the third of gummy and tartareous matter ; and the fourth of water in 17280 *parts.*

	I.	II.	III.	IV.
Malmsey,	1920	2100	1140	12120
Alicant,	1800	2900	100	12840 ?
Neufchatel,	1560	1920	900	12900
French,	1440	400	60	15380
Frontignac,	1440	1680	320	13830
Muscadine,	1440	1200	480	14160
Salamanca,	1440	1680	960	13200
Sherry,	1440	2880	1080	11880
Tinto,	1440	3120	840	11880
Hermitage,	1380	600	100	15200
Monte Pulciano,	1320	180	160	15620
Carcassone,	1320	250	80	15630
Champaigne,	1280	400	60	15540
Canary,	1140	1200	2160	12780

	I.	II.	III.	IV.
Madeira,	1140	1560	960	13620
Moselle,	1080	260	90	15850
Rhenish,	1080	200	94	15906
Tokay,	1080	2100	2400	11700
Burgundy,	1080	240	100	15860
Old rhenish,	960	480	140	15700
Pontac,	960	320	120	15880
White Brandenburgh,	960	420	180	14880?
Vin de grave,	960	360	120	15840
Red Brandenburgh,	840	280	120	16040
Aland,	840	1560	780	14100
Red Tyrol,	720	600	240	15120
Spanish,	600	1200	4560	10920

Medical use.—Wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety, which is often succeeded by headach, stupor, nausea, and diarrhœa, which last for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremors, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependance ; and when properly administered, its effects are often scarcely credible.

VINA MEDICATA.—*MEDICATED WINES.*

Wines are to be prepared in corked bottles, and frequently shaken during their preparation.

Parmentier has occupied thirty-two pages of the Annales de Chimie, to prove that wine is an extremely bad menstruum for extracting the virtues of medicinal substances. His argument (for there is but one,) is, that by the infusion of vegetable substances in wine, its natural tendency to decomposition is so much accelerated, that at the end of the process, instead of wine, we have only a liquor containing the elements of bad vinegar. As a solvent, diluted alcohol perfectly supersedes the use of wine ; and if we wish to use wine to cover the taste, or to assist the operation of any medicine, M.

Parmentier proposes, that a tincture of the substance should be extemporaneously mixed with wine as a vehicle.

Notwithstanding this argument appears to us to have great weight, we shall give to the medicated wines, retained in the Pharmacopœias, the characters they still generally possess.

VINUM ALOES. *A. D. L.* Vinum Aloes Socotorinæ. *E.*

Wine of Aloes. Wine of Socotorine Aloes.

Take of
- Socotorine aloes, in powder, ... one ounce;
- Cardamom, bruised,
- Ginger, each, ... one drachm;
- Wine, ... two pints.

Macerate for ten days, stirring occasionally, and afterwards strain.

This medicine has long been in great esteem, not only as a cathartic, but likewise as a stimulus.

It appears from long experience to be a medicine of excellent service. The dose, as a purgative, is from one to two ounces. It may be introduced into the habit, so as to be productive of excellent effects, as an alterant, by giving it in small doses, at proper intervals: thus managed, it does not for a considerable time operate remarkably by stool; but at length proves purgative, and occasions a lax habit of much longer continuance than that produced by the other common cathartics.

VINUM COLCHICI. *A.* *Wine of Meadow Saffron.*

Take of
- Fresh meadow saffron, ... one part;
- Wine, ... two parts.

Macerate for ten days, and strain.

A considerable deposit takes place by standing some time, in the vinum Colchici even after filtration: Sir E. Home has ascertained, that it is this deposit which excites nausea and griping, but that its removal does not destroy the efficacy of the medicine.

Mr. A. Gordon considers the Colchicum in greatest perfection, from early in June to the middle of August. It is necessary to use the bulb as soon as gathered, as it becomes inert. As a specific in the gout, its efficacy is ascertained; it allays pain, and cuts short the paroxysm. Dose from 30 to 60 drops.

VINUM GENTIANÆ COMPOSITUM. *A. E.*

Compound Wine of Gentian.

Take of
Gentian root, ... half an ounce;
Peruvian bark, ... one ounce;
Seville orange peel, dried, . . . two drachms;
Canella alba, ... one drachm;
Diluted alcohol, ... four ounces;
Spanish white wine, ... two pounds and a half.
First pour the spirit on the root and bark, cut and bruised, and after twenty-four hours add the wine; then macerate for seven days, and strain.

This wine is intended to supply the place of the *Tinctura ad stomachicos,* as it was formerly called. Wine is a menstruum, fully capable of extracting the active powers of the different ingredients; and it supplies us with a very useful and elegant stomachic medicine, answering the purposes intended, much better than the celebrated elixir of Van Helmont, and other unchemical and uncertain preparations, which had formerly a place in our Pharmacopœias.

VINUM IPECACUANHÆ. *A. L. D. E.* *Wine of Ipecacuanha.*

Take of
The root of Ipecacuanha, bruised, . . . two ounces;
Spanish white wine, ... two pints.
Digest for ten days, and strain.

This wine is a very mild and safe emetic, and equally serviceable in dysenteries also, with the ipecacuanha in substance; this root yielding nearly all its virtues to the Spanish white wine. The common dose is an ounce, more or less, according to the age and strength of the patient.

VINUM OPII. *A. E. L. D.* *Wine of Opium.*

Take of
Extract of opium, ... one ounce;
Cinnamon, bruised,
Cloves, bruised, of each, . . . one drachm;
Wine, ... one pint.
Macerate for eight days, and filter.

This is the Tinctura Thebaica of the Dispensatory, 1745; the Laudanum Liquidum of Hoffman, which has continued to be popular, notwithstanding its exclusion from the late Pharmacopœias. Mr. Ware, in particular, considers it as superior to every other solution of opium, as an application in chronic inflammation of the

eyes: and, with the same intention, it is sometimes used when inspissated by spontaneous evaporation.

The American Pharmacopœia uses *two ounces* of the opium to the pint of wine. Why is this? it is not the formula of the English Colleges; and it is an useless expenditure, for the wine cannot hold the amount in solution. It is called by the American Pharmacopœia, Sydenham's laudanum; but his preparation is as follows, (*Wallis's Ed.* vol. I. 239.) "Take of Spanish white wine, one pint; opium, two ounces; *saffron,* one ounce; cinnamon, and cloves reduced to powder, of each one drachm; infuse them together in a bath heat for two or three days, till the tincture becomes of a due consistence, and after straining it off, set it by for use."

VINUM RHEI. *A. E.* *Rhubarb Wine.*

Take of
- Rhubarb, sliced, ... two ounces;
- Canella alba, ... one drachm;
- Diluted alcohol, ... two ounces;
- Spanish white wine, ... fifteen ounces.

Macerate for seven days, and strain through paper.

By assisting the solvent power of the wine, the diluted alcohol in the above formula is a very useful addition.

This is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of loosenesses, for evacuating the offending matter, and strengthening the tone of the viscera. It may be given in doses of from half a spoonful to three or four spoonsful, or more, according to the circumstances of the disorder, and strength of the patient.

VINUM TABACI. *A.* VINUM NICOTIANÆ TABACI. *E.*
Tobacco Wine.

Take of
- The dried leaves of tobacco, . . . one ounce;
- Spanish white wine, ... one pound.

Macerate for seven days, and then strain the liquor.

Wine seems to extract more fully the active principles of the tobacco, than either water or spirit taken separately.

VINUM VERATRI ALBI. *A.* VINUM VERATRI. *L.*
Wine of White Hellebore.

Take of
- White hellebore, . . . four ounces;
- Wine, ... one pint.

Macerate for ten days, and filter.

W.

WINTERA. *A.* Wintera Aromatica. *E.*

Winter's Bark.

This is the produce of a tree, growing about the southern promontory of America. It was first discovered on the coast of Magellan, by captain Winter, in the year 1567 : the sailors then employed the bark as a spice, and afterwards found it serviceable in the scurvy; for which purpose it is, at present, also sometimes made use of in diet drinks. The true Winter's bark is not often met with in the shops, Canella alba being generally substituted for it; and by some, they are reckoned to be the same; there is, however, a considerable difference betwixt them in appearance, and a greater in quality. The Winter's bark is in large pieces, more of a cinnamon colour than the canella, and tastes much warmer, and more pungent. Its smell resembles that of cascarilla. Its virtues reside in a very hot, stimulant, essential oil.

Z.

ZANTHORHIZA APIIFOLIA.—XANTHORHIZA. *A.*

Zanthorhiza Tinctoria.

Yellow Root. Parsley-leaved Yellow Root. The Root.

This is a native plant of North Carolina, first brought by the late John Bartram, from that state, and planted in his garden at Kingsess, in the county of Philadelphia, where it has continued to flourish in a most luxuriant manner. It is denominated *Simplicissima* by Marshall, *Apiifolia* by L'Herretier, and *Marboisia*, by Mr. William Bartram, in honour of Mr. De Marbois. Zanthorhiza Tinctoria is a more expressive name, than any it has yet received.

Dr. Woodhouse has given an excellent account of this valuable plant, in the fifth volume of the Medical Repository of New York, from which the present extract is taken.

"The stems are three feet high, and somewhat thicker than a goose quill. The root is from three to twelve inches long, and about the diameter of a man's little finger, sending off numerous scions. The leaves are placed alternately, having long petioles and pinnated, terminating in an old one; the follicles sessile, and lacerated deeply on their edges. The *peduncles* are branchy, and placed im-

mediately beneath the first leaves, from which cause the flowers appear before the leaves, very early in the spring."

The stem and root are of a bright *yellow* colour, and possess a strong bitter taste.

The *zanthorhiza tinctoria* contains a gum and resin, both of which are intensely bitter; the resin is more abundant than the gum.

It imparts a drab colour to cloth, and a handsome yellow to silk; but the dye will not take on cotton or linen.

The watery extract of the grated roots mixed with alum, and added to Prussian blue, was first used by Mr. James Bartram, for colouring plants, and the plumage of birds, of a green colour. The green is far more lively and elegant, than that made with gamboge and Prussian blue, which is generally used for painting in water colours, and stands well in the shade, but soon contracts a dull colour when exposed to a bright light, and to a high temperature. Various subjects coloured by this green, and inclosed in a book, were as lively after one year, as when first painted.

It is a strong and pleasant bitter, and preferable to all our native bitters. It sits easy on the stomach in the dose of two scruples.

The colour of the leaves appears to reside in a resin, which is altered by the combined action of light and oxygen, by either of which, separately, it cannot be affected.

As the zanthorhiza is a strong and pleasant bitter, it promises to become a valuable addition to the American Materia Medica. Dr. Woodhouse often used the powdered stem and root of the zanthorhiza with success, in the dose of two scruples to an adult, in many of those diseases in which bitters are recommended, but generally combined with other remedies. It is a medicine which sits easy on the stomach, and produces no disagreeable effects.

ZANTHOXYLUM CLAVA HERCULIS.

Prickly Ash. Tooth-ach Tree. The Bark.

The bark is a very powerful stimulant, and exerts its effects on the salivary glands, when applied to the mouth and external fauces, and even when taken into the stomach. The seed-vessels possess the same property. It has been given internally in rheumatism. Another species, the zanthoxylum fraxinifolium, (Xanthoxylum fraxineum, *Amer. Phar.*) is a vegetable endued with very active powers. A spirituous infusion of the berries is much esteemed in Virginia, in violent colic. They are both more active than mezereon, and are well worthy of the attention of our physicians.*

It is a native of Jamaica, and other tropical countries, where it grows to the height of sixteen feet, and is about twelve inches in diameter. This straight tree somewhat resembles the common ash:

* Barton's Collections, Part I. p. 25. 52. Part II. p. 58.

the bark of the trunk is covered with numerous prickles; and the wood is of a bright yellow cast.

The wood of the zanthoxylum is chiefly employed for the heading of hogsheads, for bedsteads, and numerous other purposes; it also possesses remarkable medicinal virtues. The fresh juice expressed from the roots, affords certain relief in the painful disease, termed *dry bellyache.* This important fact was discovered in the West Indies, by watching a female slave, who collected the root in the woods, and gave two spoonsful of its juice to a negro, suffering under that colic, at an interval of two hours. Such medicine occasioned a profound, but composed sleep for twelve hours; when all sense of pain, and other distressing symptoms, had vanished: the cure was completed, by giving an infusion of the expressed root in water, by way of diet drink. Farther, the juice of the prickly yellow wood, when preserved in rum, and administered in doses not exceeding a wine-glassful, has effectually removed the most obstinate epileptic fits; but Dr. Henry has not mentioned the *manner* in which this preparation ought to be managed.

To the above observations of Dr. Willich, the following by Dr. Mease, are added: (*Dom. Ency.*)

Two species grow in the United States.

1. *Zanthoxylum fraxinifolium,* or ash-leaved zanthoxylum, growing in Pennsylvania and Maryland: and zanthoxylum clavis herculis, or prickly yellow wood, which grows in the more southern states.

The bark and capsules are of a hot, acrid taste, and when a small quantity is chewed, powerfully promotes the flow of saliva. It is used in this way to relieve the toothach. A tincture of the same parts of the tree, is a common country remedy for the chronic rheumatism.

In the West Indies, a decoction of the bark is used with great success, as an internal remedy, and also a wash for foul ulcers, which it powerfully cleanses, and disposes to healthy granulations. The powdered bark is also mixed with the dressings. In the *London Medical and Physical Journal,* volume second, and following, there are several cases related, of the efficacy of this medicine in the above disease.

ZINCUM. *A. E. L. D.—ZINC. SPELTER.*

Zinc is bluish-white, lamellated, sapid, and odorous; specific gravity 7.190; laminable, soft, clogging the file; fusible at 700°; vaporizable; a powerful agent in the phenomena of galvanism; oxydized by fusion; at a red heat it catches fire, and emits white films of oxyd, which contain about 0.33 oxygen; it is soluble in hydrogen; it combines with phosphorus, sulphur, arsenic, antimony, and mer-

cury; it easily decomposes water; it is oxydized and dissolved by almost all the acids. Oxyd, white films.

It is always found oxydized,

1. Combined with a greater or less proportion of carbonic acid. Calamine.
2. Combined with sulphur. Blende.
3. Combined with sulphuric acid, generally in solution.

The ores of zinc are rarely worked by themselves, or with the sole intention of extracting zinc, but are generally melted with the lead ores, particularly galena, which they commonly accompany. By this process the zinc is obtained in two forms; part of it is sublimed in the state of an oxyd, and attaches itself to the chimney of the furnace in the form of a grey, granular, earthy-like incrustation, which is known by the name of tutty or cadmia; part of it is sublimed in its metallic form, and is condensed in the throat of the chimney in small grains, which are afterwards melted in a crucible, and cast in ingots.

ZINCI CARBONAS IMPURUS. *A. E.*

Calaminaris. *D.* Calamina. *L.*

Impure Carbonat of Zinc. Calamine.

This mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the ores of different metals. It is usually of a greyish, brownish, yellowish, or pale reddish colour; without lustre, or transparency; fracture commonly uneven or earthy; considerably hard, though not sufficiently so as to strike fire with steel. Before the blow-pipe it decrepitates, but does not melt, and becomes yellower, and is sublimed. It is partly soluble in acids, and often effervesces with them.

Mr. Smithson has analysed several varieties of Calamine.

	Sp Grav.	Ox. of Zinc.	Carb. Acid.	Water.	Quartz.
Derbyshire,	4.333	65.2	34.8		
Somersetshire,	4.336	64.8	35.2		
Carinthia,	3.598	71.4	13.5	15.1	
Hungary,	3.434	68.3		4.4	25.
Fribourg,		38.		12.	50.

Calamine is generally roasted before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluxions of thin acrid humours upon the eyes, for drying up moist running ulcers, and healing excoriations.

CARBONATIS ZINCI IMPURUS PRÆPARATUS. *A. E.*

Prepared Impure Carbonat of Zinc.

The impure carbonat of zinc, after being roasted by those who make brass, is prepared in the same way as carbonat of lime.

As this oxyd of zinc is intended for external application, and often to parts very easily irritated, too much pains cannot be bestowed in reducing it to a fine powder.

ZINCI OXYDUM IMPURUM. *A. E.* TUTIA. *D.*

Impure Oxyd of Zinc. Tutty.

It is moderately hard and ponderous; of a brownish colour, and full of small protuberances on the outside, smooth and yellowish within; some pieces have a bluish cast, from minute globules of zinc in its metallic form. Tutty is celebrated as an ophthalmic, and frequently employed as such in unguents and collyria.

OXYDUM ZINCI IMPURUM PRÆPARATUM. *E.* TUTIA PRÆPARATA. *L.*

Prepared Impure Oxyd of Tin. Prepared Tutty.

It is prepared as carbonat of lime.

This oxyd is prepared for external use only.

OXYDUM ZINCI. *A. E. D. L.* FLORES ZINCI.

Oxyd of Zinc. Flowers of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a small piece of zinc, about the weight of a drachm. The zinc soon inflames, and is at the same time converted into white flakes, which are to be from time to time removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxyd of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxyd of zinc is to be prepared in the same way as the carbonat of lime.

This is an instance of simple oxydizement. At a red heat, zinc attracts the oxygen of the atmosphere so strongly, that it is quickly covered with a crust of white oxyd, which prevents the air from acting on the metal below; and therefore we are desired to operate only on small pieces at a time, and to place the crucible so that we may easily take out the oxyd formed, and introduce fresh pieces of zinc. As soon as the crust of oxyd is broken or removed the zinc inflames, and burns with a brilliant white or greenish, blue flame, being at the same time converted into very light white flocculi. To save these as much as possible, we are directed to use a very deep and large crucible, and to cover it with an inverted crucible. But as we must not cover it so as to prevent the access of the air, it is

doubtful whether the latter precaution be of much service. The greater part of the zinc is, however, oxydized in the crucible, without being previously converted into vapour; and as this portion of the oxyd is always mixed with particles of zinc, it is necessary to separate them by trituration and elutriation.

The oxyd thus obtained is of a pure white colour, without smell or taste, infusible and fixed in the fire, insoluble in water or alcohol, and entirely soluble in acids. The presence of lead in it is detected by sulphuric acid, which forms in that case an insoluble sulphat of lead. The white oxyd of zinc contains 82.15 zinc, and 17.85 oxygen.

Mr. Phillips recommends, instead of this tedious process, an oxyd, or rather a subcarbonat prepared by decomposing sulphat of zinc by subcarbonat of potash. "If solutions, consisting of about eight parts of the former and five of the latter, be boiled together for a short time, a very light white precipitate is obtained, containing about twelve per cent. of carbonic acid. Should the sulphat of zinc be contaminated with oxyd of iron, it may be separated by potash, previous to the precipitation of the oxyd of zinc by the subcarbonat."

Medical use.—White oxyd of zinc is applied externally as a detergent and exsiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chaps, or excoriated nipples. But besides being applied externally, it has also been used internally. In doses from one to seven or eight grains, it has been much celebrated in the cure of epilepsy and several spasmodic affections: and there are sufficient testimonies of their good effects, where tonic remedies in those affections are proper.

Sulphas Zinci. *E. D. L.* Vitriolum Album.

Sulphat of Zinc. White Vitriol.

Take of

Zinc, cut into small pieces, . . . three ounces;
Sulphuric acid, ... five ounces;
Water, ... twenty ounces.

Mix them, and when the effervescence is finished, digest the mixture for a little on hot sand; then strain the decanted liquor through paper, and after proper evaporation set it apart, that it may crystallize.

This is chiefly found native in the mines of Goslar, sometimes in transparent pieces, but more commonly in the form of white efflorescences, which are dissolved in water, and afterwards reduced by evaporation and crystallization, into large masses. But as native sulphat of zinc is seldom pure, it is ordered to be prepared.

The sulphat of zinc of commerce, is never pure, but always contains iron, copper, and a little lead. From the mode of its preparation, there is also a deficiency of acid and water of crystallization. The means directed for purifying it by the London and Dublin col-

leges will supply these, but do not separate the foreign metals, except perhaps the lead. If, therefore, a pure sulphat of zinc be wanted, we may, acording to the directions of the Edinburgh college, dissolve pure zinc in pure sulphuric acid; but we believe this process is very rarely practised, especially as the common sulphat of zinc may be sufficiently purified by exposing it in solution to the air, by which means red oxyd of iron is precipitated, and by digesting it upon pure zinc, which precipitates the other metals.

Sulphat of zinc crystallizes in tetrahedral prisms, terminated by pyramids. It has a metallic styptic taste; effloresces slowly when exposed to the air. It is soluble in 2.5 parts of water at 60°, and in much less boiling water. It is not soluble in alcohol. It is decomposed by the alkalies and earths, hydrogureted sulphurets, and sulphureted hydrogurets. It consists of 20 oxyd of zinc, 40 acid, and 40 water of crystallization.

Medical use.—Sulphat of zinc, in doses from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time, perfectly safe. It is therefore given, when immediate vomiting is required, as in cases where poison has been swallowed. By employing it internally, in smaller doses, it acts as a tonic; and some think it in every case, preferable to the oxyd of zinc.

Externally, it is used as a styptic application to stop hemorrhagies; diminish increased discharges, as gonorrhœa; and to cure external inflammations arising from debility and relaxation of the blood-vessels, as in some cases of ophthalmia.

We may observe, that although the American Pharmacopœia employs this salt as the basis of some of its preparations, it is not, itself, introduced into the lists of the Materia Medica.

Solutio Sulphatis Zinci. *E.* *Solution of Sulphat of Zinc.*

Take of
Sulphat of zinc, ... sixteen grains;
Water, ... eight ounces;
Diluted sulphuric acid, . . . sixteen drops.

Dissolve the sulphat of zinc in the water; then, having added the acid, filter through paper.

The acid is here added to dissolve the excess of oxyd of zinc, which the common sulphat often contains. This solution is of a strength proper for injecting into the urethra in gonorrhæa, or applying to the eyes in chronic ophthalmia.

Liquor Aluminis Compositus. *L.* *Compound Solution of Alum.*

Take of
Alum,
Vitriolated zinc, of each, . . . half an ounce;
Boiling distilled water, ... two pints.

Pour the water on the salts in a glass vessel, and strain.

This water was long known in the shops, under the title of *Aqua aluminosa Bateana.*

It is used for cleansing and healing ulcers and wounds; and for removing cutaneous eruptions, the part being bathed with it hot, three or four times a day. It is sometimes likewise employed as a collyrium; and as an injection in gonorrhœa and fluor albus, when not accompanied with virulence.

Solutio Acetatis Zinci. *E.* *Solution of Acetat of Zinc.*

Take of
- Sulphat of zinc, ... one drachm;
- Acetat of lead, ... four scruples;
- Distilled water, ... twenty ounces.

Dissolve each salt separately in ten ounces of water, mix the solutions, and filter the liquor.

If this is suffered to crystallize, it forms the acetat of zinc of the American Pharmacopœia.

This is a case of double elective attraction, the lead combining and forming an insoluble compound with the sulphuric acid, while the zinc unites with the acetic acid, and remains in solution.

The acetat of zinc may be obtained by evaporation in talcky crystals. It is soluble in water, and is decomposed by heat. It is not poisonous.

When crystallized acetat of lead and sulphat of zinc are triturated together, the mixture presently becomes moist, which is owing to the new compounds combining with less water of crystallization than the original salts, by which means a portion of the water is disengaged in its fluid form.

Medical use.—The solution of acetat of zinc, is, with many practitioners, deservedly much esteemed as an astringent collyrium, and injection. The solution in spirit of wine, of the Dublin college, is stronger and more stimulant than that in water of the Edinburgh.

Tinctura Acetatis Zinci. *D.* *Tincture of Acetat of Zinc.*

Take of
- Sulphat of zinc,
- Acetat of kali, each, . . . one ounce.

Triturate them together, and add one pint of rectified spirit of wine. Macerate for a week, with occasional agitation, and strain through paper.

JALAP. (*Additional.*)

For the following communication, I am indebted to Mr. Nuttall, whose botanical knowledge must render every thing interesting which he attempts to elucidate on the subject of Jalap. I have only to regret that I did not receive it in time, to introduce it in its appropriate place in the body of the work itself. (p .225.)

"All the synonymes of this drug, from *Bryonia Mechoacana* NIGRICANS of Casper Bauhins Pinax. p. 298, and Prodromus, p. 135, to that of Aiton, agree pretty nearly with each other, and do not very materially differ from the specific character given by Linnæus in his Mantina, p. 43. *Convolvulus foliis difformibus, cordatis angulatis oblongis lanceolatisque, caule volubili, pedunculis unifloris ;* but are by no means referable to the *Ipomœa macrorhiza* of Michaux, considered by Desfontaines as identic with the *Convolvulus jalapa;* but with which it disagrees not only in external characters, but what is much more important, in its medicinal virtues. Hence, in the work which I published on the genera of North American Plants, Vol. I. p. 123, I ventured to dissent from Persoon and Desfontaines, on the ground of its alleged inertness as a medicine, according to the experiments of the late Dr. Baldwyn.

"The error into which Desfontaines has fallen, originated in his too confident reliance on the description and authority of Thiery de Menonville, who in 1777, visited the country of Xalapa, where this drug originated. In his voyage to Guaxaca, he does not, however, describe the plant there collected for sale, but a *supposed* (for so it must now be considered,) identical plant, growing in the vicinity of Vera Cruz, and of whose medicinal virtues, the inhabitants were till then ignorant. This plant, as might not unreasonably be expected, corresponded in every respect with that which had been transmitted to the Botanic Garden at Paris, from East Florida, by the late André Michaux, in whose book it is very properly described as an *Ipomœa*, under the specific appellation of *macrorhiza*, with a query, that might be added to almost every tuberous-rooted species of the genus; whether or not, it might be the *Convolvulus Jalapa* of Linnæus? Under the impression of this supposed identity, the celebrated Desfontaines, in the Second volume of the Annales du Museum, published a figure and description of the plant discovered by Michaux, perfectly distinct from that collected by Houston, described by Aiton, and slightly figured in Woodville, which indeed, much more nearly resembles the *Convolvulus panduratus*, (particularly an entire leaved variety of the western states,) than Michaux's large rooted Ipomœa. It is probable, that all the milky juiced species of Convolvulus and Ipomœa, may prove medicines, more or less active in their operation. In some, this lactescent fluid is afforded by the stems, in others by the roots. At all events, no specific character can be drawn from their medicinal effects.

This species of Ipomœa described by Thiery de Menonville and Michaux, as you supposed, may much more probably be referred to the *Convolvulus mechoacana*, of Linnæus, of which I have not been able to obtain any account; it being omitted in all the editions of the *species plantarum*, to which I have now access. In Rees' Cyclopædia, all notice of Desfontaines's memoir is omitted, and the synonymes and remarks there published, evidently apply to a very different plant from that of Michaux.

"The synonymes quoted by Ray, are Convolvulus Americanus Mechoacan dictus. Jeticucu Braziliensibus seu radix Mechoacan,—MARGR. Bryonia mechoacana alba,—CASP. BAUHIN. Bryonia alba Peruana sive Mechoacan,—PARK. Mechoacan,—J. B.——. Margraaf describes it as producing a twining stem, giving out a milky sap on incision, and bearing alternate or solitary cordate leaves, from one to four inches long, upon longish petioles, of a deep green ; beneath *conspicuously* nerved, and transversely veined. The flowers are white, a little tinged

with red, and internally purple, of the usual magnitude and figure of the Convolvulus. The seeds about the size of a pea, are somewhat triangular, and of a brownish colour. The root is about a foot in length, and mostly of an equal breadth, often bifid, with one of the parts shorter than the other, externally of a dull grey, or brownish colour, internally *white,* and when recent, exuding a resinous fluid.—Raii *Historia Plantarum,* t. I. pp. 723, 724.

"As this root then, improperly considered a Briony, was frequently intermixed by collectors, with the true Jalap, *Bryonia Mechoacana nigricans,* (distinguished by its root having a blackish bark, and a brownish, or yellowish colour internally,) it is not so very surprising that Thiery de Menonville should have confounded the two species together, and described the latter as the true jalap, which had even once been mistaken for a species of *Mirabilis.*

"Michaux's character of the *Ipomœa macrorhiza,* as given by Persoon, *Foliis cordatis lobatisque plicatis subtus tomentosis, pedunculis subunifloris.* Rad. *crassissima.*—Corolla *magna, alba;* Sem. *lanuginosa,** accords pretty nearly with the plant described by Margraaf. They both agree in one remarkable particular, very unusual in this genus, that, of the somewhat plaited leaves, an effect which would of course, produce that conspicuous veining and nerving on the under side, remarked by Margraaf, and which does not exist in the leaves of the true Jalap."

Connected with this subject, I may here mention, that I received a letter from Dr. Thomas Townsend, of Wooster, Wayne county, Ohio, dated in May, 1821, in which he states, that "several species of Convolvulus grow in the country indigenous, and I believe the Jalap and Scammony." A specimen sent me at the same time, which the Doctor took to be Scammony, was in such a state of mouldiness, &c. that nothing could be learned relative to it. He subsequently, in October, sent me two specimens in flower, of what he believed to be the Scammony plant; but which, as far as could be ascertained by Mr. Nuttall, would seem to be the Convolvulus Arvensis. A portion of *extract* from the plant, sent at the same time, I found to act as an excellent purgative, in doses of 8 to 10 grains, producing four or five evacuations of a watery consistence, and without much griping.

The doctor has afforded me no information as to the medicinal powers of the article, in his hands; nor as to the reasons which led him to the opinion he entertains. It would, certainly, not be astonishing, if amongst the different species he mentions to exist amongst them, that both the Scammony and Jalap should be found. It will, however, be evident, from what has been said on the subject of Jalap, that all obscurity in relation to it, is not yet fully removed.

* This plant, which appears to be the *Convolvulus mechoacana,* of Linnæus, *Ipomœa macrorhiza,* of Michaux, is now cultivated by Mr. Dick, in the garden of the University of Pennsylvania.

PHARMACEUTICAL OPERATIONS.

OF THE COLLECTION AND PRESERVATION OF SIMPLES.

EACH of the kingdoms of nature furnishes articles which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

In collecting these, attention must be paid to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

Those precautions must be taken which are best fitted for preserving them. They must in general be defended from the effects of moisture, too great heat, or cold, and confined air.

When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give a few general rules for their collection and preservation.

Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry soils, and high situations, fully exposed to the air and sun, are in general to be preferred to those which are cultivated, or which grow in moist, low, shady, or confined places.

Roots which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the first, or spring of the second year; perennial roots either in spring before the sap has begun to mount, or in harvest after it has returned.

Those which are worm eaten, (except some resinous roots,) or which are decayed, are to be rejected. The others are immediately to be cleaned with a brush and cold water, letting them lie in it as short time as possible; and the fibres and little roots, when not essential, are to be cut away.

Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by simply exposing them, and frequently turning them in a current of cold dry air; if very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled fresh, and then dried. Such as lose their virtues by drying, or are directed to be preserved in a fresh state, are to be kept buried in dry sand.

No very general rule can be given for the collection of herbs and leaves, some of them acquiring activity from their age, and others, as the mucilaginous leaves, from the same cause, losing the property for which they are officinal. Aromatics are to be collected after the flower-buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they shoot; and perennials, before they flower, especially if their fibres become woody.

They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are usually tied in bundles, and hung up in a shady, warm, and airy place; or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

Sprouts are collected before the buds open; and stalks are gathered in autumn.

Barks and woods are collected when the most active part of the vegetables are concentrated in them, which happens in spring and in autumn. Spring is preferred for resinous barks, and autumn for the others which are not resinous, but rather gummy. Barks should be taken from young trees, and freed from decayed parts, and all impurities.

The same rules direct the collection of woods; but they must not be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

Flowers are collected in clear dry weather, before noon, but after the dew is off: either when they are just about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: These are called heads or tops.

Flowers and herbs are to be dried by the gentle heat of a stove or common fire, in such quantities at a time, that the process may be finished as quickly as possible; for by this means their powers are best preserved; the test of which is the perfect preservation of their natural colour. When they lose their colour and smell they are unfit for use.

Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. Some pulpy fruits are freed from their core and seeds, strung upon thread, and

dried artificially. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled, and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then no longer fit for medical use, no very large quantity of them should be collected at a time.

The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade, and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an error, for they always lose infinitely more by slow than by quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and well exposed to a current of air. When perfectly dry and friable, they have little smell; but after being kept some time, they attract moisture from the air, and regain their proper odour.

The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, of a delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool, and dry, but by no means in a warm, or moist place.

Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose properties are more permanent, and not subject to decay, will keep for several years.

Vegetables collected in a moist and rainy season, are in general more watery and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, and keep much better.

MECHANICAL OPERATIONS OF PHARMACY.

a. The determination of the weight and bulk of bodies.
b. The division of bodies into more minute particles.
c. The separation of their integrant parts by mechanical means.
d. Their mixture, when not attended by any chemical action.

The quantities of substances employed in pharmaceutical operations are most accurately determined by the process called weighing. For this purpose, there should be sets of beams and scales of different sizes; and it would be advisable to have a double set, one for ordinary use, and another for occasions when greater accuracy is necessary. A good beam should remain in equilibrium without the scales, and when the scales are changed; and it should turn sensibly with a very small proportion of the weight with which it is loaded. Balances should be defended as much as possible from acid and other corrosive vapours, and should not be left suspended longer than is necessary, as it impairs their delicacy very much. For the same reason, balances should never be overloaded.

The want of uniformity of weights and measures is attended with many inconveniences. In this country and Great Britain, druggists and grocers sell by avoirdupois weight; and the apothecaries are directed to sell by troy weight, although, in fact, they seldom use the troy weight for more than two drachms. Hence arise numerous and culpable errors, the troy pound being less than the avoirdupois, and the ounce and drachm being greater.

The errors arising from the promiscuous use of weights and measures, have induced the Edinburgh and Dublin Colleges to reject the use of measures entirely, and to direct that the quantities of every thing fluid, as well as solid, shall be determined by troy weight: but the London College have given their sanction to the use of measures, and from the much greater facility of their employment, apothecaries will probably always use them.

The American Pharmacopœia has directed the use of weights and measures, in the following table.

Weights and Measures.

"To express the quantity of solid bodies, we employ the kind of weight, which in common language is denominated *Troy Weight*, and divide the pound in the following manner.

The pound, ℔	contains	Twelve ounces	℥
The ounce		Eight drachms	ʒ
The drachm		Three scruples	℈
The scruple		Twenty grains	*gr.*

"We have added the signs by which the several weights are denoted.

"To express the quantity of liquids, we employ the measures which are derived from the wine gallon, and for medical purposes we divide it in the following manner.

The gallon, cong.	contains	Eight pints	O
The pint		Sixteen fluidounces	f℥
The fluid ounce,		Eight fluiddrachms	fʒ
The fluid drachm		Sixty minims	♏

"We have added the signs by which we denote the several measures."

For measuring fluids, the graduated glass measures are always to be preferred: they should be of different sizes, according to the quantities they are intended to measure. Elastic fluids are also measured in glass tubes, graduated by inches and their decimals.

Specific gravity is the weight of a determinate bulk of any body. As a standard of comparison, distilled water has been assumed as unity. The specific gravity of solids is ascertained, by comparing the weight of the body in the air with its weight when suspended in water. The quotient obtained by dividing its weight in air by the dif-

ference between its weight in air and its weight in water, is its specific gravity. The specific gravity of fluids may be ascertained by comparing the loss of weight of a solid body, such as a piece of crystal, when immersed in distilled water, with its loss when immersed in the fluid we wish to examine ; by dividing its loss of weight in the fluid by its loss of weight in the water, the quotient is the specific gravity of the fluid : or a small phial, containing a known weight of distilled water, may be filled with the fluid to be examined and weighed, and by dividing the weight of the fluid by the weight of the water, the specific gravity is ascertained.

The only other mode of expressing specific gravities, which it is necessary to notice, is that of Baumé's areometer; as it is often used in the writings of the French chemists, and is little understood in this country. For substances heavier than water, he assumes the specific gravity of distilled water as zero, and graduates the stem of his instrument downwards, each degree being supposed by him to express the number of parts of muriat of soda contained in a given solution, which however is not at all the case. For substances lighter than water, the tube is graduated upwards, and this zero is afforded by a solution of 10 of salt in 90 of water.

MECHANICAL DIVISION.

By mechanical division, substances are reduced to a form better adapted for medical purposes; and by the increase of their surface, their action is promoted, both as medical and chemical agents.

It is performed by cutting, bruising, grinding, grating, rasping, filing, pulverization, trituration, and granulation, by means of machinery or of proper instruments.

Pulverization is the first of these operations that is commonly employed in the apothecary's shop. It is performed by means of pestles and mortars. The bottom of the mortars should be concave; and their sides should neither be so inclined as not to allow the substances operated on to fall to the bottom between each stroke of the pestle, nor so perpendicular as to collect it too much together, and to retard the operation. The materials of which pestles and mortars are formed, should resist both the mechanical and chemical action of the substances for which they are used. Wood, iron, marble, siliceous stones, porcelain, and glass, are all employed; but copper, and metals containing copper, are to be avoided.

They should be provided with covers, to prevent the finest and lightest parts from escaping, and to defend the operator from the effects of disagreeable or noxious substances. But these ends are more completely attained by tying a piece of pliable leather round the pestle and round the mouth of the mortar. It must be closely applied, and at the same time so large as to permit the free motion of the pestle.

In some instances, it will be even necessary for the operator to cover his mouth and nostrils with a wet cloth, and to stand with his back to a current of air, that the very acrid particles which arise may be carried from him.

The addition of a little water or spirit of wine, or of a few almonds, to very light and dry substances, will prevent their flying off. But almonds are apt to induce rancidity, and powders are always injured by the drying which is necessary when they have been moistened. Water must never be added to substances which absorb it, or are rendered cohesive by it.

Too great a quantity of any substance must never be put into the mortar at a time, as it very much retards the operation.

All vegetable substances must be previously dried. Resins and gummy resins, which become soft in summer, must be powdered in very cold weather, and must be beaten gently, or they will be converted into a paste instead of being powdered. Wood, roots, barks, horn, bone, ivory, &c. must be previously cut, split, chipped, or rasped. Fibrous woods and roots should be finely shaved after their bark is removed, for otherwise their powders will be full of hair-like filaments, which can scarcely be separated. Some substances will even require to be moistened with mucilage of tragacanth, or of starch, and then dried before they can be powdered. Camphor may be conveniently powdered by the addition of a little spirit of wine, or almond oil. The emulsive seeds cannot be reduced to powder, unless some dry powder be added to them. To aromatic oily substances, sugar is the best addition.

All impurities and inert parts having been previously separated, the operation must be continued and repeated upon vegetable substances, till no residuum is left. The powders obtained at different times must then be intimately mixed together, so as to bring the whole to a state of perfect uniformity.

Very hard stony substances must be repeatedly heated to a red heat, and then suddenly quenched in cold water, until they become sufficiently friable. Some metals may be powdered hot in a heated iron mortar, or may be rendered brittle by alloying them with a little mercury.

Trituration is intended for the still more minute division of bodies. It is performed in flat mortars of glass, agate, or other hard materials, by giving a rotatory motion to the pestle, or on a levigating stone, which is generally of porphyry, by means of a muller of the same substance. On large quantities it is performed by rollers of hard stone, turning horizontally upon each other, or by one vertical roller turning on a flat stone.

The substances subjected to this operation are generally previously powdered or ground.

Levigation differs from trituration only in the addition of water or spirit of wine to the powder operated upon, so as to form the whole mass into a kind of paste, which is rubbed until it be of sufficient smoothness or fineness. Earths, and some metallic substances, are levigated.

Granulation is employed for the mechanical division of some metals. It is performed, either by stirring the melted metal with an iron rod until it cools, or by pouring it into water, and stirring it

continually as before, or by pouring it into a covered box, previously well rubbed with chalk, and shaking it until the metal cools, when the rolling motion will be converted into a rattling one. The adhering chalk is then to be washed away.

MECHANICAL SEPARATION.

Sifting. From dry substances, which are reduced to the due degree of minuteness, the coarser particles are to be separated by sieves of iron-wire, hair-cloth or gauze, or by being dusted through bags of fine linen. For very light and valuable powders, or acrid substances, compound sieves, having a close lid and receiver, must be used. The particles which are not of sufficient fineness to pass through the interstices of the sieve, may be again powdered.

Elutriation is confined to mineral substances, on which water has no action. It is performed for separating them from foreign particles and impurities, of a different specific gravity, in which case they are said to be washed: or for separating the impalpable powders obtained by trituration and levigation, from the coarser particles. This process depends upon the property that very fine or light powders have of remaining for some time suspended in water; and is performed by diffusing the powder or paste formed by levigation through plenty of water, letting it stand a sufficient time, until the coarser particles settle at the bottom, and then pouring off the liquid in which the finer or lighter particles are suspended. Fresh water may be poured on the residuum, and the operation repeated; or the coarser particles which fall to the bottom may be previously levigated a second time. The fine powder which is washed over with the water, is separated from it, by allowing it to subside completely, and by decanting off the water very carefully.

Decantation is very frequently made use of for separating the clear from the turbid part of a fluid, and for separating fluids from solids, which are specifically heavier, especially when the quantity is very large, or the solid so subtile as to pass through the pores of most substances employed for filtration, or the liquid so acrid as to corrode them.

Filtration. For the purposes of separating fluids from solids, straining and filtration are often used. These differ only in degree, and are employed when the powder either does not subside at all, or too slowly and imperfectly for decantation.

The instruments for this purpose are of various materials, and must in no instance be acted upon by the substances for which they are employed. Fats, resins, wax and oils, are strained through hemp or flax, spread evenly over a piece of wire-cloth or net stretched in a frame. For saccharine and mucilaginous liquors, fine flannel may be used; for some saline solutions, linen. Where these are not fine enough, unsized paper is employed, but it is extremely apt to burst by hot watery liquors. Very acrid liquors, such as acids, are filtered by means of a glass funnel, filled with powdered quartz, a few of the larger pieces being put in the neck, smaller pieces over these, and the fine powder placed over all. The porosity of this last filter

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retains much of the liquor; but it may be obtained by gently pouring on it an equal quantity of distilled water; the liquor will then pass through, and the water will be retained in its place.

Water may be filtrated in large quantities through basins of porous stone, or artificial basins of nearly equal parts of fine clay and coarse sand. In large quantities it may be easily purified *per ascensum*, the purified liquor and impurities thus taking opposite directions. The simplest apparatus of this kind is a barrel, divided perpendicularly, by a board perforated with a row of holes along the lower edge. Into each side, as much well washed sand is put as will cover these holes an inch or two, over which must be placed a layer of pebbles to keep it steady. The apparatus is now fit for use. Water poured into the one half will sink through the sand in that side, pass through the holes in the division to the other, and rise through the sand in the other half, from which it may be drawn by a stopcock.

The size of the filters depends on the quantity of matter to be strained. When large, the flannel or linen is formed into a conical bag, and suspended from a hoop or frame; the paper is either spread on the inside of these bags, or folded into a conical form, and suspended by a funnel. It is of advantage to introduce glass rods or quills between the paper and the funnel, to prevent them from adhering too closely.

What passes first is seldom fine enough, and must be poured back again until by the swelling of the fibres of the filter, or filling up of its pores, the fluid acquires the requisite degree of limpidity. The filter is sometimes covered with charcoal powder, which is a useful addition to muddy and deep-coloured liquors. The filtration of some viscid substances is much assisted by heat.

Expression is a species of filtration, assisted by mechanical force. It is principally employed to obtain the juices of fresh vegetables, and the unctuous vegetable oils. It is performed by means of a screw press, with plates of wood, iron, or tin. The subject of the operation is previously beaten, ground or bruised. It is then inclosed in a bag, which must not be too much filled, and introduced between the plates of the press. The bags should be of hair-cloth, or canvass inclosed in hair-cloth. Hempen and woollen bags are apt to give vegetable juices a disagreeable taste. The pressure should be gentle at first, and increased gradually.

Vegetables intended for this operation should be perfectly fresh, and freed from all impurities. In general they should be expressed as soon as they are bruised, for it disposes them to ferment; but subacid fruits give a larger quantity of juice, and of finer quality, when they are allowed to stand some days in a wooden or earthen vessel after they are bruised. To some vegetables which are not juicy enough, the addition of a little water is necessary. Lemons and oranges must be peeled, as their skins contain a great deal of essential oil, which would mix with the juice. The oil itself may be obtained separately, by expression with the fingers on a piece of glass.

For unctuous seeds iron plates are used; and it is customary not

only to heat the plates, but to warm the bruised seeds in a kettle over the fire, after they have been sprinkled with water, as by these means the product is increased, and the oil obtained is more limpid. But as the oils obtained in this way are more disposed to rancidity, this process should either be laid aside altogether, or changed to exposing the bruised seeds, inclosed in a bag, to the steam of hot water.

Despumation is generally practised on thick and clammy liquors, which contain much slimy and other impurities, not easily separable by filtration. The scum is made to arise, either by simply heating the liquor, or by *clarifying* it, which last is done by mixing with the liquor, when cold, white of egg well beaten with a little water, which on being heated coagulates and rises to the surface, carrying with it all the impurities. The liquor may now be filtered with ease, or may be skimmed with a perforated ladle. Spirituous liquors are clarified without the assistance of heat, by means of isinglass dissolved in water, or of any albuminous fluid, as milk, which coagulates with the action of alcohol. Some expressed juices, as those of all the antiscorbutic plants, are instantly clarified by the addition of any vegetable acid, as the juice of bitter oranges.

Fluids can only be separated from each other, when they have no tendency to combine, and when they differ in specific gravity. The separation may be effected by skimming off the lighter fluid with a silver or glass spoon; or by drawing it off by a syringe or syphon; or by means of a glass separatory, which is an instrument having a projecting tube, terminating in a very slender point, through which the heavier fluid alone is permitted to run; or by means of the capillary attraction of a spongy woollen thread; for no fluid will enter a substance whose pores are filled by another, for which it has no attraction; and lastly, upon the same principle, by means of a filter of unsized paper, previously soaked in one of the fluids, which in this way readily passes through it, while the other remains behind.

Mechanical mixture is performed by agitation, trituration, or kneading.

APPARATUS.

The various apparatus for chemical operations are so largely described in most of the elementary treatises, especially that of Henry, as to render it unnecessary to dwell upon them here.

CHEMICAL OPERATIONS.

In all chemical operations, combination takes place, and there are very few of them in which decomposition does not also occur. For the sake of method, we shall consider them as principally intended to produce,

a. Change in the form of aggregation;
b. Combination;
c. Decomposition.

The form of aggregation may be altered by,

a. Fusion;
b. Vaporization;
c. Condensation;
d. Congelation;
e. Coagulation.

Liquefaction is commonly employed to express the melting of substances, as tallow, wax, resin, &c. which pass through intermediate states of softness before they become fluid.

Fusion is the melting of substances which pass immediately from the solid to the fluid state, as the salts and the metals, except iron and platinum. Substances differ very much in the degrees of their fusibility; some, as water and mercury, existing as fluids in the ordinary temperatures of the atmosphere; while others, as the pure earths, cannot be melted by any heat we can produce.

When a substance acquires by fusion a degree of transparency, a dense uniform texture, and great brittleness, and exhibits a conchoidal fracture, with a specular surface, and the edges of the fragments very sharp, it is said to be *vitrified.*

In general, simple substances are less fusible than compounds; thus the simple earths cannot be melted singly, but when mixed are easily fused. The additions which are sometimes made to refractory substances to promote their fusion, are termed *fluxes.*

These fluxes are generally saline bodies.

a. The alkalies, potass, and soda, promote powerfully the fusion of siliceous stones; but they are only used for accurate experiments. The *white flux* is a mixture of a little potass with carbonat of potass, and is prepared by deflagrating together *epual* parts of nitrat of potass and supertartrat of potass. When an oxyd is at the same time to be reduced, the *black* flux is to be preferred, which is produced by the deflagration of *two* parts of supertartrat of potass, and *one* of nitrat of potass. It differs from the former only in containing a little charcoal. Soap promotes fusion by being converted by the fire into carbonat of soda and charcoal.

b. Aluminous stones have their fusion greatly promoted by the addition of sub-borat of soda.

c. Muriat of soda, the mixed phosphat of soda and ammonia, and other salts, are also occasionally employed.

An open fire is sufficient to melt some substances; others require the heat of a furnace.

The vessels in which fusion is performed, must resist the heat necessary for the operation. In some instances, an iron or copper ladle or pot may be used; but most commonly crucibles are employed.—*Crucibles* are of various sizes. The large crucibles are generally conical, with a small spout for the convenience of pouring out: the small ones are truncated triangular pyramids, and are commonly sold in nests.

Fusion is performed with the intentions,

a. Of weakening the attraction of aggregation,
  1. To facilitate mechanical division;
  2. To promote chemical action.

b. Of separating from each other, substances of different degrees of fusibility.

Vaporization is the conversion of a solid or fluid into vapour by the agency of caloric. Although vaporability be merely a relative term, substances are said to be permanently elastic, volatile, or fixed. The permanently elastic fluids or gases are those which cannot be condensed into a fluid or solid form by any abstraction of caloric we are capable of producing. Fixed substances, on the contrary, are those which cannot be converted into vapour, by great increase of temperature. The pressure of the atmosphere has a very considerable effect in varying the degree at which substances are converted into vapour. Some solids, unless subjected to very great pressure, are at once converted into vapour, although most of them pass through the intermediate state of fluidity.

Vaporization is employed,

a. To separate substances differing in volatility.
b. To promote chemical action, by disaggregating them.

When employed with either of these views, either

a. No regard is paid to the substances volatilized,
  1. From solids, as in ustulation and charring;
  2. From fluids, as in evaporation;

b. Or the substances vaporized are condensed in proper vessels,
  1. In a liquid form, as in distillation;
  2. In a solid form, as in sublimation;

c. Or the substances disengaged are permanently elastic, and are collected in their gaseous form, in a pneumatic apparatus.

Ustulation is almost entirely a metallurgic operation, and is employed to expel the sulphur and arsenic contained in some metallic ores. It is performed on small quantities in tests placed within a muffle. Tests are shallow vessels made of bone ashes, or baked clay. Muffles are vessels of baked clay, of a semi-cylindrical form, the flat side forming the floor, and the arched portion the roof and sides. The end and sides are perforated with holes for the free transmission of the heated air, and the open extremity is placed at the door of the furnace, for the inspection and manipulation of the process. The reverberatory furnace is commonly employed for roasting, and the heat is at first very gently and slowly raised to redness. The process is accelerated by exposing as large a surface of the substance to be roasted as possible, and by stirring it frequently, so as to prevent any agglutination, and to bring every part in succession to the surface.

Charring may be performed on any of the compound oxyds, by subjecting them to a degree of heat sufficient to expel all their hydrogen, nitrogen, and oxygen; while the carbon, being a fixed prin-

ciple, remains behind in the state of charcoal. The temperature necessary for the operation may be produced either by the combustion of other substances, or by the partial combustion of the substance to be charred. In the former case, the operation may be performed in any vessel which excludes the air while it permits the escape of the vapours formed. In the latter, the access of air must be regulated in such a manner, that it may be suppressed whenever the combustion has reached the requisite degree; for if continued to be admitted, the charcoal itself would be dissipated in the form of carbonic acid gas, and nothing would remain but the alkaline and earthy matter, which these substances always contain. When combustion is carried this length, the process is termed *incineration.* The vapours which arise in the operation of charring, are sometimes condensed, as in the manufacture of tar.

Evaporation is the conversion of a fluid into vapour, by its combination with caloric. In this process, the atmosphere is not a necessary agent, but rather a hindrance, by its pressure. This forms a criterion between evaporation and spontaneous evaporation, which is merely the solution of a fluid in air.

It is performed in open, shallow, or hemispherical vessels of silver, tinned copper, or iron, earthen-ware, or glass. The necessary caloric may be furnished by means of an open fire, a lamp, or a furnace, and applied either directly, or by the intervention of sand, water, or vapour. The degree of heat must be regulated by the nature of the substance operated on. In general, it should not be greater than what is absolutely necessary.

Evaporation may be,

a. Partial:
1. From saline fluids, Concentration;
2. From viscid fluids, Inspissation.

b. Total, Exsiccation.

Concentration is employed,

a. To lessen the quantity of diluting fluids; Deflegmation:
b. As a preliminary step to Crystallization.

Inspissation is almost confined to animal and vegetable substances; and as these are apt to be partially decomposed by heat, or to become empyreumatic, the process should always be performed, especially towards the end, in a water or vapour bath.

Exsiccation is here taken in a very limited sense; for the term is also with propriety used to express the drying of vegetables by a gentle heat, the efflorescence of salts, and the abstraction of moisture from mixtures of insoluble powders with water, by means of chalk-stones, or powdered chalk pressed into a smooth mass. At present, we limit its meaning to the total expulsion of moisture from any body by means of caloric.

The exsiccation of compound oxyds should always be performed in the water bath.

Salts are deprived of their water of crystallization, by exposing them to the action of heat in a glass vessel, or iron ladle. Sometimes they first dissolve in their water of crystallization (or undergo what is called the *watery fusion,*) and are afterwards converted into a dry mass by its total expulsion; as in the calcination of borax or burning of alum.

When exsiccation is attended with a crackling noise, and splitting of the salt, as in muriat of soda, it is termed *decrepitation,* and is performed by throwing into a heated iron vessel, small quantities of the salt at a time, covering it up, and waiting until the decrepitation be over, before a fresh quantity is thrown in.

Exsiccation is performed on saline bodies, to render them more acrid and pulverulent, or to prepare them for chemical operations. Animal or vegetable substances are exsiccated to give them a solid form, and to prevent their fermentation.

Condensation is the reverse of expansion, and is produced either,

a. By mechanical pressure forcing out the caloric in a sensible form, as water is squeezed out of a sponge; or,

b. By the chemical abstraction of caloric, which is followed by an approximation of the particles of the substance.

The latter species of condensation only is the object of our investigation at present. In this way, we may be supposed to condense,

a. Substances existing naturally as gases or vapours;

b. Substances, naturally solid or fluid, converted into vapours by adventitious circumstances.

The former instance is almost supposititious; for we are not able, by any diminution of temperature, to reduce the permanently elastic fluids to a fluid or solid state.

The latter instance is always preceded by vaporization, and comprehends those operations in which the substances vaporised, are condensed in proper vessels. When the product is a fluid, it is termed distillation; when solid, sublimation.

Distillation is said to be performed,

a. *Viâ humidâ,* when fluids are the subject of the operation;

b. *Viâ siccâ,* when solids are subjected to the operation, and the fluid product arises from decomposition, and a new arrangement of the constituent principles.

The objects of distillation are,

a. To separate more volatile fluids from less volatile fluids, or solids;

b. To promote the union of different substances;

c. To generate new products by the action of fire.

In all distillations, the heat applied should not be greater than what is necessary for the formation of the vapour, and even to this degree it should be gradually raised. The vessels also in which the distillation is performed, should never be filled above one-half: and

sometimes not above one-fourth, lest the substance contained in them should boil over.

As distillation is a combination of evaporation and condensation, the apparatus consists of two principal parts;

a. The vessels in which the vapours are formed;
b. The vessels in which they are condensed.

The vessels employed for both purposes, are variously shaped, according to the manner in which the operation is conducted. The first difference depends on the direction of the vapour after its formation. It either

a. Descends; distillation *per descensum:*
b. Ascends; distillation *per ascensum:*
c. Or passes off by the side; distillation *per latus.*

In the distillation *per descensum,* a perforated plate, generally of tinned iron, is fixed within any convenient vessel, so as to leave a space beneath it. The subject of the operation is laid on this plate, and is covered by another, accurately fitting the vessel, and sufficiently strong to support the fuel which is burnt upon it. Thus the heat is applied from above, and the vapour is forced to descend into the inferior cavity, where it is condensed. In this way the oil of cloves is prepared, and on the same principles tar is manufactured, and mercury and zinc are separated from their ores.

In the distillation *per ascensum* the vapour is allowed to arise to some height, and then is conveyed away to be condensed. The vessel most commonly employed for this purpose is the common copper-still, which consists of a body for containing the materials, and a head into which the vapour ascends. From the middle of the head a tube arises a short way, and is then reflected downwards, through which the steam passes to be condensed. Another kind of head, rising to a great height before it is reflected, is sometimes used for separating fluids, which differ little in volatility, as it was supposed that the less volatile vapours would be condensed, and fall back into the still, while only the more volatile vapours would arise to the top, so as to pass to the refrigeratory. The same object may be more conveniently attained by managing the fire with caution and address. The greater the surface exposed, and the less the height the vapours have to ascend, the more rapidly does the distillation proceed; and so well are these principles understood by the Scotch distillers, that they do not take more than three minutes to discharge a still containing fifty gallons of fluid.

The condensing apparatus used with the common still is very simple. The tube in which the head terminates, is inserted into the upper end of a pipe, which is kept cool by passing through a vessel filled with water, called the Refrigeratory. This pipe is commonly made of a serpentine form; but as this renders it difficult to be cleaned, Dr. Black recommends a sigmoid pipe. The refrigeratory may be furnished with a stop-cock, that when the water it contains becomes too hot, and does not condense all the vapour produced, it

may be changed for cold water. From the lower end of the pipe, the product of the distillation drops into the vessel destined to receive it; and we may observe, that when any vapour issues along with it, we should either diminish the power of the fire, or change the water in the refrigeratory.

Circulation was a process formerly in use. It consisted in arranging the apparatus, so that the vapours were no sooner condensed into a fluid form, than this fluid returned back into the distilling vessels, to be again vaporised; and was effected by distilling in a glass vessel, with so long a neck that the vapours were condensed before they escaped at the upper extremity, or by inverting one matrass within another.

When corrosive substances are distilled *per ascensum*, the cucurbit and alembic are used; but these substances are more conveniently distilled *per latus*.

The distillation *per latus* is performed in a retort, or pear-shaped vessel, having the neck bent to one side. The body of a good retort is well rounded, uniform in its appearance, and of an equal thickness, and the neck is sufficiently bent to allow the vapours, when condensed, to run freely away, but not so much as to render the application of the receiver inconvenient, or to bring it too near the furnace. The passage from the body into the neck must be perfectly free and sufficiently wide, otherwise the vapours produced in the retort only circulate in its body, without passing over into the receiver. For introducing liquors into the retort without soiling its neck, which would injure the product, a bent funnel is necessary. It must be sufficiently long to introduce the liquor directly into the body of the retort; and in withdrawing it, we must keep it carefully applied to the upper part of the retort, that the drop hanging from it may not touch the inside of the neck. In some cases, where a mixture of different substances is to be distilled, it is convenient and necessary to have the whole apparatus properly adjusted before the mixture is made, and we must therefore employ a tubulated retort, or a retort furnished with an aperture, accurately closed with a ground stopper.

The tubulature should be placed on the upper convex part of the retort before it bends to form the neck, so that a fluid poured through it may fall directly into the body without soiling the neck.

Retorts are made of various materials. Flint-glass is commonly used when the heat is not so great as to melt it. For distillations which require excessive degrees of heat, retorts of earthen-ware, or coated glass retorts, are employed. Quicksilver is distilled in iron retorts.

The simplest condensing apparatus used with the retort, is the common glass receiver; which is a vessel of a conical or globular form, having a neck sufficiently wide to admit the neck of a retort. To prevent the loss and dissipation of the vapours to be condensed, the retort and receiver may be accurately ground to each other, or secured by some proper lute. Means must also be used to prevent the receiver from being heated by the caloric evolved during the

condensation of the vapours. It may either be immersed in cold water, or covered with snow or pounded ice; or a constant evaporation may be supported from its surface, by covering it with a cloth, kept moist by means of the descent of water, from a vessel placed above it, through minute syphons or spongy worsted threads. But as, during the process of distillation, permanently elastic fluids are often produced, which would endanger the breaking of the vessels, these are permitted to escape, either through a tubulature, or hole in the side of the receiver, or rather through a hole made in the luting. Receivers having a spout issuing from their side, are used when we wish to keep separate the products obtained at different periods of any distillation. For condensing very volatile vapours, a series of receivers, communicating with each other, termed Adopters, were formerly used; but these are now entirely superseded by Woulfe's apparatus.

This apparatus consists of a tubulated retort, adapted to a tubulated receiver. With the tubulature of the receiver, a three-necked bottle is connected by means of a bent tube, the further extremity of which is immersed, one or more inches, in some fluid contained in the bottle. A series of two or three similar bottles are connected with this first bottle in the same way. In the middle tubulature of each bottle, a glass tube is fixed, having its lower extremity immersed about a quarter of an inch in the fluid. The height of the tube above the surface of the fluid must be greater than the sum of the columns of fluid standing over the farther extremities of the connecting tubes, in all the bottles or vessels more remote from the retort. Tubes so adjusted are termed Tubes of Safety, for they prevent that reflux of fluid from the more remote into the nearer bottles, and into the receiver itself, which would otherwise inevitably happen, on any condensation of vapour taking place in the retort, receiver, or nearer bottles. Different contrivances for the same purpose have been described by Messrs. Welter and Burkitt; and a very ingenious mode of connecting the vessels without lute has been invented by Citizen Girard, but they would not be easily understood without plates. The further tubulature of the last bottle is commonly connected with a pneumatic apparatus, by means of a bent tube. When the whole is properly adjusted, air blown into the retort should pass through the receiver, rise in bubbles through the fluids contained in each of the bottles, and at last escape by the bent tube. In the receiver, those products of distillation are collected, which are condensable by cold alone. The first bottle is commonly filled with water, and the others with alkaline solutions, or other active fluids; and as the permanently elastic fluids produced are successively subjected to the action of all these, only those gases will escape by the bent tube which are not absorbable by any of them.

PNEUMATIC APPARATUS.

The great importance of the elastic fluids in modern chemistry, has rendered an acquaintance with the means of collecting and preserving them indispensable.

When a gas is produced by any means, it may be received either,

a. Into vessels absolutely empty; or
b. Into vessels filled with some fluid, on which it exerts no action.

The first mode of collecting gases, may be practised by means of a bladder, moistened sufficiently to make it perfectly pliable, and then compressed so as to empty it entirely. In this state it may be easily filled with any gas. An oiled silk bag will answer the same purpose, and is more convenient in some respects, as it may be made of any size or form.

Glass or metallic vessels, such as balloons, may also be emptied for the purpose of receiving gases, by fitting them with a stop-cock, and exhausting the air from them by means of an air-pump.

But the second mode of collecting gases is the most convenient and common.

The vessels may be filled either,

a. With a fluid lighter; or
b. Heavier than the gas to be received into it.

The former method is seldom employed; but if we conduct a stream of any gas heavier than atmospheric air, such as carbonic acid gas, muriatic acid gas, &c. to the bottom of any vessel, it will gradually displace the air, and fill the vessel.

On the contrary, a gas lighter than the atmospheric air, such as hydrogen, may be collected in an inverted vessel by conducting a stream of it to the top.

But gases are most commonly collected by conducting the stream of gas into an inverted glass jar, or any other vessel filled with water or mercury. The gas ascends to the upper part of the vessel, and displaces the fluid. In this way gas may be kept a very long time, provided a small quantity of the fluid be left in the vessels, which prevents both the escape of the gas, and the admission of atmospheric air.

The vessels may be of various shapes; but the most commonly employed are cylindrical. They may be either open only at one extremity, or furnished at the other with a stop-cock.

The manner of filling these vessels with fluid, is to immerse them completely in it, with the open extremity directed a little upwards, so that the whole air may escape from them, and then inverting them with their mouths downwards.

For filling them with convenience, a trough or cistern is commonly used. This either should be hollowed out of a solid block of wood or marble; or, if it be constructed of wood, it should be well painted, or lined with lead or tinned copper. Its size may vary very much; but it should contain a sufficient depth of fluid to cover the largest transverse diameter of the vessels to be filled in it. At one end or side, there should be a shelf for holding the vessels after they are filled. This shelf should be placed about an inch and a half below

the surface of the fluid, and should be perforated with several holes, forming the apices of corresponding conical excavations on the lower side, through which, as through inverted funnels, gaseous fluids may be more easily introduced into the vessels placed over them. In general, the vessels used with a mercurial apparatus should be stronger and smaller than those for a water-cistern.

We should also have a variety of glass and elastic tubes for conveying the gases from the vessels in which they are formed, to the funnels under the shelf.

Rectification is the repeated distillation of any fluid. When distillation renders the fluid stronger, or abstracts water from it, it is termed *Dephlegmation.* When a fluid is distilled off from any substance, it is called *Abstraction;* and if the product be redistilled from the same substance, or a fresh quantity of the substance, it is denominated *Cohobation.*

Sublimation differs from distillation only in the form of the product. When it is compact, it is termed a Sublimate; when loose and spongy, it formerly had the improper appellation of Flowers. Sublimation is sometimes performed in a crucible, and the vapours are condensed in a paper cone, or in another crucible inverted over it; sometimes in the lower part of a glass flask, cucurbit, or phial, and the condensation is effected in the upper part or capital, and sometimes in a retort with a very short and wide neck, to which a conical receiver is fitted. The heat is most commonly applied through the medium of a sand-bath; and the degree of heat, and the depth to which the vessel is inserted in it, are regulated by the nature of the sublimation.

Congelation is the reduction of a fluid into a solid form, in consequence of the abstraction of caloric. The means employed for abstracting caloric are the evaporation of volatile fluids, the solution of solids, and the contact of cold bodies.

Coagulation is the conversion of a fluid into a solid of greater or less consistence, merely in consequence of a new arrangement of its particles, as during the process there is no separation of caloric or any other substance. The means of producing coagulation are, increase of temperature, and the addition of certain substances, as acids and runnets.

COMBINATION.

Chemical combination is the intimate union of the particles of at least two heterogeneous bodies. It is the effect resulting from the exertion of the attraction of affinity, and is therefore subjected to all the laws of affinity.

To produce the chemical union of any bodies, it is necessary,

1. That they possess affinity for each other;
2. That their particles come into actual contact;
3. That the strength of the affinity be greater than any counteracting causes which may be present.

The principal counteracting causes are,

1. The attraction of aggregation;
2. Affinities for other substances.

The means to be employed for overcoming the action of other affinities, will be treated of under Decomposition.

The attraction of aggregation is overcome by means of

1. Mechanical division.
2. The action of caloric.

Combination is facilitated by increasing the points of actual contact,

1. By mechanical agitation;
2. By condensation; compression.

The processes employed for producing combination, may be considered,

1. With regard to the nature of the substances combined; and,
2. To the nature of the compound produced.

Gases,

1. Combine with gases;
2. Dissolve fluids or solids;
3. Or are absorbed by them.

Fluids,

1. Are dissolved in gases;
2. Or absorb them;
3. Combine with fluids;
4. And dissolve solids;
5. Or are rendered solid by them.

Solids,

1. Are dissolved in fluids and in gases; or,
2. Absorb gases;
3. And solidify fluids.

The combination of gases with each other, in some instances, takes place when simply mixed together: thus nitrous and oxygen gases combine as soon as they come into contact; in other instances, it is necessary to elevate their temperature to a degree sufficient for their inflammation, either by means of the electric spark, or the contact of an ignited body, as in the combination of oxygen gas with hydrogen or nitrogen gas.

When gases combine with each other, there is always a considerable diminution of bulk, and not unfrequently they are condensed into a liquid or solid form. Hydrogen and oxygen gases form water: muriatic acid and ammonia gases form solid muriat of ammonia. But when the combination is effected by ignition, a violent expansion, which endangers the bursting of the vessels, previously takes place, in consequence of the increase of temperature.

Solution is the diminution of aggregation in any solid or fluid substance, in consequence of its entering into chemical combination. The substance, whether solid or fluid, whose aggregation is lessened, is termed the *Solvend;* and the substance, by whose agency the solution is effected, is often called the *Menstruum* or *Solvent.*

Solution is said to be performed *via humida,* when the natural form of the solvent is fluid; but when the agency of heat is necessary to give the solvent its fluid form, the solution is said to be performed *via sicca.*

The dissolving power of each menstruum is limited, and is determinate with regard to each solvend. The solubility of bodies is also limited, and determinate with regard to each menstruum.

When any menstruum has dissolved the greatest possible quantity of any solvend, it is said to be saturated with it. But, in some cases, although saturated with one substance, it is still capable of dissolving others. Thus a saturated solution of muriat of soda will dissolve a certain quantity of nitrat of potass, and after that a portion of muriat of ammonia.

The dissolving power of solvents, and consequently the solubility of solvends, are generally increased by increase of temperature; and conversely, this power is diminished by diminution of temperature; so that, from a saturated solution, a separation of a portion of the solvend generally takes place on any reduction of temperature. This property becomes extremely useful in many chemical operations, especially in crystallization.

Particular terms have been applied to particular cases of solution.

The solution of a fluid in the atmosphere is termed *spontaneous evaporation.* It is promoted by exposing a large surface, by frequently renewing the air in contact with the surface, and by increase of temperature.

Some solids have so strong an affinity for water, that they attract it from the atmosphere in sufficient quantity to dissolve them. These are said to *deliquesce.* Others, on the contrary, retain their water of crystallization with so weak a force, that the atmosphere attracts it from them, so that they crumble into powder. These are said to *effloresce.* Both operations are promoted by exposing large surfaces, and by a current of air; but the latter is facilitated by a warm dry air, and the former by a cold humid atmosphere.

Solution is also employed to separate substances (for example, saline bodies,) which are soluble in the menstruum, from others which are not. When our object is to obtain the soluble substance in a state of purity, the operation is termed *lixiviation.* In this as small a quantity of the menstruum as is possible is used. When, however, solution is employed to free an insoluble substance from soluble impurities, it is termed *edulcoration,* which is best performed by using a very large quantity of the menstruum.

Organic products being generally composed of heterogeneous substances, are only partially soluble in the different menstrua. To the solution of any of these substances, while the others remain un-

dissolved, the term *extraction* is applied; and when, by evaporation, the substance extracted is reduced to a solid form, it is termed an Extract, which is hard or soft, watery or spirituous, according to the degree of consistency it acquires, and the nature of the menstruum employed.

Infusion is employed to extract the virtues of aromatic and volatile substances, which would be dissipated by decoction, and destroyed by maceration, and to separate substances of easy solution from others which are less soluble. The process consists in pouring upon the substance to be infused, placed in a proper vessel, the menstruum, either hot or cold, according to the direction, covering it up, agitating it frequently, and after a due time straining or decanting off the liquor, which is then termed the Infusion.

Maceration differs from infusion, it being continued for a longer time, and can only be employed for substances which do not easily ferment or spoil.

Digestion, on the other hand, differs from maceration only in the activity of the menstruum being promoted by a gentle degree of heat. It is commonly performed in a glass matrass, which should only be filled one-third, and covered with a piece of wet bladder, pierced with one or more small holes, so that the evaporation of the menstruum may be prevented as much as possible, without risk of bursting the vessel. The vessel may be heated, either by means of the sun's rays, of a common fire, or of the sand-bath; and when the last is employed, the vessel should not be sunk deeper in the sand than the portion that is filled. Sometimes, when the menstruum employed is valuable, a distilling apparatus is used to prevent any waste of it. At other times, a blind capital is luted on the matrass, or a small matrass is inverted within a larger one; and as the vapour which arises is condensed in it, and runs back into the larger, the process in this form has got the name of *Circulation*.

Decoction is performed by subjecting the substances operated on to a degree of heat, which is sufficient to convert the menstruum into vapour, and can only be employed with advantage for extracting principles which are not volatile, and from substances whose texture is so dense and compact as to resist the less active methods of solution. When the menstruum is valuable, that portion of it which is converted into vapour is generally saved by condensing it in a distilling apparatus.

Solutions in alcohol are termed Tinctures, and in vinegar or wine, Medicated Vinegars or Wines. The solution of metals in mercury is termed Amalgamation. The combinations of other metals with each other form Alloys.

Absorption is the condensation of a gas into a fluid or solid form, in consequence of its combination with a fluid or solid. It is facilitated by increase of surface and agitation; and the power of absorption in fluids is much increased by compression and diminution of temperature, although in every instance it be limited and determinate. Dr. Nooth invented an ingenious apparatus for combining

gases with fluids; and Messrs. Schweppe, Henry, Paul, and Cuthbertson, have very advantageously employed compression.

Consolidation. Fluids often become solid by entering into combination with solids; and this change is always accompanied by considerable increase of temperature, as in the slaking of lime.

DECOMPOSITION.

Decomposition is the separation of bodies which were chemically combined.

It can only be effected by the agency of substances possessing a stronger affinity for one or more of the constituents of the compound, than these possess for each other.

Decomposition has acquired various appellations, according to the phenomena which accompany it.

Dissolution differs from solution in being accompanied by the decomposition, or a change in the nature of the substance dissolved. Thus, we correctly say, a solution of lime in muriatic acid, and a dissolution of chalk in muriatic acid.

Sometimes a gas is separated during the action of bodies on each other. When this escapes with considerable violence and agitation of the fluid, it is termed *effervescence.* The gas is very frequently allowed to escape into the atmosphere, but at other times is either collected in a pneumatic apparatus, or made to enter into some new combination.—The vessels in which an effervescing mixture is made, should be high and sufficiently large, to prevent any loss of the materials from their running over; and in some cases the mixture must be made slowly and gradually.

Precipitation is the reverse of solution. It comprehends all those processes in which a solid is obtained by the decomposition of a solution. The substance separated is termed a Precipitate, if it sink to the bottom of the fluid; or a Cream, if it swim above it. Precipitation, like solution, is performed either *via humida* or *via sicca.*

The objects of precipitation are,

1. The separation of substances from solutions in which they are contained;
2. The purification of solutions from precipitable impurities;
3. The formation of new combinations.

Precipitation is effected,

1. By lessening the quantity of the solvent by evaporation;
2. By diminishing its solvent power, as by reduction of temperature, or dilution;
3. Or by the addition of some chemical agent, which from its more powerful affinities,
   a. Either combines with the solvent, and precipitates the solvend,
   b. Or forms itself an insoluble compound with some constituent of the solution.

The two first means of precipitation have been already noticed.

Indeed they are rarely considered as instances of precipitation, as the effect is gradual, and the precipitated matter most commonly assumes determinate figures.

In performing it in the last manner, we may observe the following rules:

1. The solution and precipitant must possess the requisite degree of purity.
2. The solution should be perfectly saturated, to avoid unnecessary consumption of the solvent or precipitant.
3. The one is to be added slowly and gradually to the other.
4. After each addition, they are to be thoroughly mixed by agitation.
5. We must allow the mixture to settle, after we think that enough of the precipitant has been added, and try a little of the clear solution, by adding to it some of the precipitant: if any precipitation takes place, we have not added enough of precipitant. This precaution is necessary, not only to avoid loss, but, in many instances, the precipitant, if added in excess, redissolves, or combines with, the precipitate.

After the precipitation is completed, the precipitate is to be separated from the supernatant fluid by some of the means already noticed.

When the precipitate is the chief object of our process, and when it is not soluble in water, it is often advisable to dilute, to a considerable degree, both the solution and precipitant, before performing the operation. When it is only difficultly soluble, we must content ourselves with washing the precipitate, after it is separated by filtration. In some cases, the separation of the precipitate is much assisted by a gentle heat.

Crystallization is a species of precipitation, in which the particles of the solvend, on separating from the solution, assume certain determinate forms.

Almost all substances, on crystallizing, retain a portion of water combined with them, which is essential to their existence as crystals, and is therefore denominated water of crystallization. Its quantity varies very much in different crystallized substances.

The means by which the particles of bodies are disaggregated, so as to admit of crystallization, are solution, fusion, vaporization, or mechanical division and suspension in a fluid medium.

The means by which the disaggregating causes are removed, are, evaporation, reduction of temperature, and rest.

When bodies are merely suspended in a state of extreme mechanical division, nothing but rest is necessary for their crystallization.

When they are disaggregated by fusion or vaporization, the regularity of their crystals depends on the slowness with which their temperature is reduced; for if cooled too quickly, their particles have not time to arrange themselves, and are converted at once into a

confused or unvaried solid mass. Thus glass, which, when cooled quickly, is perfectly uniform in its appearance, when cooled slowly, has a crystalline texture. But in order to obtain crystals by means of fusion, it is often necessary, after the substance has begun to crystallize, to remove the part which remains fluid; for otherwise it would fill up the interstices among the crystals first formed, and give the whole the appearance of one solid mass. Thus, after a crust has formed on the top of melted sulphur, by pouring off the still fluid part, we obtain regular crystals.

The means by which bodies, which have been disaggregated by solution, are made to crystallize most regularly, vary according to the habitudes of the bodies with their solvents and caloric.

Some saline substances are much more soluble in hot than in cold water; therefore, a boiling saturated solution of any of these will deposite, on cooling, the excess of salt, which it is unable to dissolve when cold. These salts commonly contain much water of crystallization.

Other salts are scarcely, if at all, more soluble in hot than in cold water; and therefore, their solutions must be evaporated, either by heat, or spontaneously. These salts commonly contain little water of crystallization.

The beauty and size of the crystals depend upon the purity of the solution, its quantity, and the mode of conducting the evaporation and cooling.

When the salt is not more soluble in hot than in cold water, by means of gentle evaporation, a succession of pellicles is formed on the top of the solution, which either are removed, or permitted to sink to the bottom by their own weight; and the evaporation is continued until the crystallization be completed.

But when the salt is capable of crystallizing on cooling, the evaporation is only continued until a drop of the solution, placed upon some cold body, shows a disposition to crystallize, or at farthest only until the first appearance of a pellicle. The solution is then covered up, and set aside to cool; and the more slowly it cools, the more regular are the crystals. The mother-water, or solution which remains after the crystals are formed, may be repeatedly treated in the same way as long as it is capable of furnishing any more salt.

When very large and beautiful crystals are wanted, they may be obtained by laying well-formed crystals in a saturated solution of the same salt, and turning them every day. In this way their size may be considerably increased, though not without limitation; for after a certain time, they grow smaller instead of larger.

Crystallization is employed,

1. To obtain crystallizable substances in a state of purity;
2. To separate them from each other, by taking advantage of their different solubility at different temperatures.

OXYGENIZEMENT.

The combination of oxygen is the object of many chemical and pharmaceutical processes.

With regard to the manner of combination, the oxygenizement may take place, either,

a. Without the production of heat and light, to express which there is no other than the generic term *oxygenizement;* or,
b. With the production of heat and light; *combustion.*
1. In substances which remain fixed at the temperature necessary for their combustion, there is no other more specific term;
2. In substances which exist as gases, or are previously reduced to the state of vapour by the temperature necessary, it is termed *inflammation;* and if it proceed with very great violence and rapidity, *deflagration.*

Combustion and inflammation have been already described.

Deflagration, from its violence, must always be performed with caution. The common mode of conducting this process is, to introduce the substances to be deflagrated together into any convenient vessel, commonly an iron pot, or crucible, heated to redness. But to obviate any inconvenience, and to insure the success of the process, they are previously made perfectly dry, reduced to powder, and thoroughly mixed together. The compound is then deflagrated gradually, generally by spoonfuls; but we must take care always to examine the spoon, lest a spark should adhere to it, which might set fire to the whole mass. During the process, the portion introduced should be frequently stirred.

The oxygen necessary for the process of oxygenation may be derived from the decomposition,

a. Of oxygen gas, or atmospheric air;
b. Of oxyds, particularly water;
c. Of acids and their combinations.

The different modes of oxygenizement are intended, either,

a. To produce heat and light;
b. To obtain an oxygenized product;
1. An oxyd, when the process may be termed *Oxydizement.*
2. An acid, *Acidification.*
c. To remove an oxygenizable substanee.

Hydrogen, carbon, and nitrogen, are never, unless for experiment, oxygenized as simple substances.

Sulphur is converted into sulphuric acid by burning it in leaden chambers, or by deflagrating it with nitrat of potass: and phosphorus is acidified by inflammation in the atmosphere.

Of all the simple oxygenizable substances, the metals are most frequently combined with oxygen; and, as in consequence of this combination, they lose their metallic appearance, they were formerly said to be calcined or corroded.

Metals differ very much in the facility with which they are oxygenized by the contact of oxygen gas. For some, as iron and man-

ganese, the ordinary temperature of the atmosphere is necessary; but others, as potassium and sodium, are oxygenized even by the contact of ice; while others as gold, and platinum, scarcely undergo any change in the most violent heat. Upon these the operation is performed by heating them to the requisite temperature, and exposing them to the action of the air: and on the fusible metals it is promoted by stirring them when melted.

Metals also differ in the mode of their action upon water. They are either capable of decomposing water,

a. At every temperature, as potassium and sodium.
b. At ordinary temperatures, as iron, zinc, manganese, &c.
c. At elevated temperatures, as antimony and tin; or
d. When acted upon at the same time by an acid or an alkali, as copper, lead, bismuth; or, lastly,
e. They are incapable of decomposing it, as gold, silver, mercury, platinum.

The oxygenizement of metals by water is promoted by the action of air. Iron, for example, is more quickly rusted by being merely moistened with water, than when totally immersed in water.

But the acids are the most powerful agents in oxygenizing metals. They act, in two ways, either,

1. By enabling them to decompose water;
2. By being decomposed themselves.

The metals are susceptible of different degrees of oxygenizement, some of them even of acidification, and, in general, they are more oxygenized according to the rapidity of the process. When proceeding too slowly, it may be accelerated by heat; when too violent, it must be checked by diminution of temperature, as by plunging the vessel in which the operation is performed into cold water.

When the degree of oxygenizement is not very great, the oxyd formed generally enters into combination with the acid employed, and forms a metallic salt; but when carried to its highest degree, the oxyd is often insoluble.

DISOXYGENIZEMENT OF METALLIC OXYDS AND ACIDS.

This process was formerly termed *reduction*, from its restoring the metals to their metallic splendour, and is performed by causing some body to act upon them, which has a greater affinity for oxygen than they have. The different metals themselves vary very much in the degree of this affinity, so that they are reduced with very different degrees of facility. Gold, silver, platinum, and mercury, are reduced by merely exposing them to a sufficient degree of heat in close vessels. The oxygen at this temperature has a greater affinity for caloric than for the metals, and is therefore driven off in the form of very pure oxygen gas.

Some other metallic oxyds which resist the simple action of heat, may be reduced by melting them in contact with charcoal, or substances which may be charred, such as oil, fat, resin, pitch, &c. Be-

sides the charcoal, different saline fluxes are also added to facilitate the fusion of the oxyd.

The oxyd to be reduced is mixed with a sufficient quantity of any of these substances, and placed in the bottom of a crucible, which is afterwards filled up with charcoal powder, to prevent entirely the access of the air, and exposed for a length of time to a sufficiently high temperature, when a button of the metal will commonly be found in the bottom of the crucible. Upon the volatile metals, such as arsenic and zinc, this operation must be performed in a distilling or subliming apparatus. Some metallic oxyds, such as those of platinum, columbium, &c. cannot be reduced, from our being unable to produce a degree of heat sufficient to melt them.

But galvanism is by far the most powerful disoxygenizing process. By means of it the metallic bases of the alkalies and earths have been discovered.

Metals may be also obtained from the metallic salts, by inserting in a solution of these a plate of another metal, possessing a stronger affinity for oxygen than for the acid. Thus copper is precipitated by iron, and arsenic by zinc. We must only take care that the two metals have no remarkable affinity for each other, as in that case an alloy is commonly produced. For example, when mercury is placed in a solution of silver, a crystallized amalgam of silver is obtained, formerly called the Arbor Dianæ.

The compound oxyds, (vegetable and animal substances), may be further oxygenized, by treating them with nitric acid. In this way various oxyds and acids are formed, according to the nature of the oxyd operated on, the quantity of the acid, and the mode of conducting the process.

These substances also undergo changes by gradually combining with the oxygen of the atmosphere. In some cases, this combination is attended with remarkable phenomena, which have been classed under the term *fermentation.*

There are several species of fermentation, which have been named from the products they afford.

1. The saccharine, which produces sugar.
2. The vinous, which produces wine, and similar fluids.
3. The panary, which produces bread.
4. The acetic, which produces vinegar.
5. The putrefactive, which produces ammonia.

The same substances are sometimes capable of undergoing the first, second, fourth, and fifth; or third, fourth, and fifth, successively, but never in a retrograde order.

The conditions necessary for all of them are,

1. The presence of a sufficient quantity of fermentable matter;
2. The presence of a certain proportion of water;
3. The contact of atmospheric air; and,
4. A certain temperature.

The saccharine fermentation.—The seeds of barley, when moist-

ened with a certain quantity of water, and exposed to the contact of the atmospheric air, at a temperature of not less than 50°, swell, and show marks of incipient vegetation, by pushing forth the radicle. If at this period the fermentation be checked, by exposing them to a considerable degree of heat, and drying them thoroughly, the insipid amylaceous matter, of which the seeds principally consisted, will be found to be changed in part into a sweet saccharine substance. The oxygen of the air, in contact with the seeds, is at the same time converted into carbonic acid gas, by combining with part of the carbon of the seeds; and there is a considerable increase of temperature in the fermenting mass, even to such a degree as sometimes to set it on fire. Similar phenomena occur in the maturation of fruits; in the cookery of some roots and fruits, and during the heating of hay, when put up too wet.

The vinous fermentation.—The conditions necessary for the vinous fermentation, are, the presence of proper proportions of sugar, acid, extract, and water, and a temperature of about 70°. When these circumstances exist, an intestine motion commences in the fluid; it becomes thick and muddy, its temperature increases, and carbonic acid gas is evolved. After a time the fermentation ceases, the feces rise to the top, or subside to the bottom, the liquor becomes clear, it has lost its saccharine taste, and assumed a new one, and its specific gravity is diminished. If the fermentation has been complete, the sugar is entirely decomposed, and the fermented liquor consists of a large proportion of water, of alcohol, of malic acid, of extract, of essential oil, and colouring matter. The substances most commonly subjected to this fermentation are *must,* which is the expressed juice of the grape, and which produces the best wines; the juice of the currant and gooseberry, which, with the addition of sugar, form our home-made wines; the juices of the apple and pear, which give cyder and perry; and an infusion of malt, which, when fermented with yeast, forms beer. The briskness and sparkling of some of these liquors depend on their being put into close vessels before the fermentation is completed, by which means a portion of carbonic acid gas is retained.

The acetic fermentation.—All vinous liquors are susceptible of the acetic fermentation, provided they be exposed to the action of the atmosphere, in a temperature not less than 70°. An intestine motion and hissing noise sensibly take place in the fluid; it becomes turbid, with filaments floating in it, and its temperature increases; it exhales a pungent acid smell, without any disengagement of carbonic acid gas. Gradually these phenomena cease; the temperature decreases, the motion subsides, and the liquor becomes clear, having deposited a sediment and red glairy matter, which adheres to the sides of the vessel. During this process, the alcohol and malic acid disappear entirely, oxygen is absorbed, and acetic acid formed.

The panary and colouring fermentation—is less understood than those already described. A paste of wheat-flour and water, exposed to a temperature of 65°, swells, emits a small quantity of gas, and acquires new properties. The gluten disappears, and the paste ac-

quires a sour disagreeable taste. If a just proportion of this fermented paste or leaven, or, what is still better, if some barm, be formed into a paste with wheat-flour and water, the same fermentation is excited, without the disagreeable taste being produced; the gas evolved is prevented from escaping by the viscidity of the paste, which therefore swells, and if baked, forms light spongy bread.

The putrefactive fermentation.—Although vegetable substances, when they are destroyed by spontaneous decomposition, are said to putrefy, we shall consider this fermentation as belonging exclusively to animal substances, or those which contain nitrogen as an elementary principle. The essential conditions of putrefaction are humidity, and a temperature between 45° and 110°. The presence of air, the diminution of pressure, and the addition of ferments, are not essential, but accelerate its progress. The smell is at first vapid and disagreeable, but afterwards insupportably fetid, although the fetor, for a time, is somewhat diminished by the mixture of an ammoniacal odour. Liquids become turbid and flocculent. Soft substances melt down into a gelatinous mass, in which there is a kind of gentle motion and swelling up, from the slow and scanty formation of elastic fluids. Solids, beside the general softening, exude a serosity of various colours, and by degrees the whole mass dissolves, the swelling ceases, the matter settles, and its colour deepens; at last its odour becomes somewhat aromatic, its elements are finally dissipated, and there remains only a kind of fat, viscid, and still fetid mould. The products of putrefaction are carbureted, sulphureted, and phosphureted hydrogen gases, water, ammonia, nitrogen, and carbonic acid. These are all dissipated in the form of gas or vapour. When in contact with air, oxygen is absorbed. Acetic acid, a fatty matter, a soap composed of this fat and ammonia, and often the nitric acid, fixed by a salifiable base, are also produced; and the ultimate remains, besides salts, composed of acid and earths, contain for a long time a portion of fat charry matter.

APPENDIX.

TABLES OF WEIGHTS AND MEASURES.

ENGLISH.

APOTHECARY OR TROY WEIGHT.

Pound.		Ounces.		Drams.		Scruples.		Grains.
℔ 1	=	12	=	96	=	288	=	5760
		℥ 1	=	8	=	24	=	480
				ʒ 1	=	3	=	60
						℈ 1	=	20
								gr. 1

SIGNS OF QUANTITY.

A pound	℔i	A scruple	℈i
An ounce	℥i	A grain	gr. i
A drachm	ʒi		

AVOIRDUPOIS WEIGHT.

Pounds.		Ounces.		Drams.		Troy grains.
1	=	16	=	256	=	7000
		1	=	16	=	437.5
				1	=	27.34375

MEASURE, LONDON PHARMACOPŒIA.

Gallon.		Pints.		Fluid oun.		Fluid dr.		Minims.		Troy gr.		Cubic inch.
1	=	8	=	128	=	1024	=	61440	=	58443	=	231
		O 1	=	16	=	128	=	7680	=	7305	=	28.875
				f℥ 1	=	8	=	480	=	456.5	=	1.8047
						fʒ 1	=	60	=	57	=	0.2256
								♏ 1	=	0.9	=	0.0374

Table of Specific Gravities indicated in the different Pharmacopœias.

	Dublin.	London.	Edinburgh.	American.
Sulphuric ether	765			
Nitrous ether	900			
Spirit of nitrous ether	850			
Alcohol	815	815		
Rectified spirit (alcohol)	840	835	835	835
Proof spirit	930	930	935	
Acetic acid	1070			
Distilled vinegar	1006			
Oxymuriatic acid	1003			
Muriatic acid	1170	1160	1170	1160
diluted	1080			
Nitric acid	1500	1500	1520	1500
diluted	1280			
Sulphuric acid	1845	1850	1845	1850
diluted	1090			
Solution of potass	1100	1050		
ammonia	936	960		
carbonat of ammonia	1095			
carbonat of soda, saturated	1220			
oxymuriat of potass	1087			
sulphuret of potass	1120			
Tincture of muriat of iron (red)	1050			

Cases of Mutual Decomposition.

1. FROM SIMPLE AFFINITY.

Sulphat of potass	with	Muriat of baryta
soda	—	Nitrat of potass
ammonia	—	Muriat of potass
magnesia	—	Carbonat of potass
Supersulphat of alumina	—	Muriat of lime
Nitrat of potass	—	baryta
ammonia	—	Phosphat of soda
Muriat of baryta	—	All the sulphats and nitrats
soda	—	Carbonat of potass
lime	—	Sub-borat of soda
ammonia	—	Carbonat of potass
Phosphat of soda	—	Muriat of ammonia
Sub-borat of soda	—	Carbonat of potass
Nitrat of silver	—	Muriat of soda
Acetat of lead	—	Citrat of potass
Sulphat of mercury	—	Muriat of soda
Soap of potass	—	soda
soda	—	Sulphat of lime

2. FROM COMPOUND AFFINITY.

Sulphat of baryta . .	with	Carbonat of potass
baryta . .	—	soda
potass . .	—	Muriat of lime
soda . .	—	Ditto
Muriat of baryta . .	—	Phosphat of soda
Ditto . . .	—	Sub-borat of soda
Ditto . . .	—	Carbonat of potass
Ditto . . .	—	soda
Ditto . . .	—	ammonia
Muriat of lime . .	—	ammonia
Phosphat of soda . .	—	lime
Acetat of lead . .	—	Sulphat of zinc
Ditto . . .	—	Nitrat of mercury

*Table of Incompatible Salts.**

SALTS	INCOMPATIBLE WITH
1. Fixed alkaline sulphats	Nitrats of lime and magnesia Muriats of lime and magnesia
2. Sulphat of lime	Alkalies Carbonat of magnesia Muriat of barytes
3. Alum	Alkalies Muriat of barytes Nitrat, muriat, carbonat of lime Carbonat of magnesia
4. Sulphat of magnesia	Alkalies Muriat of barytes Nitrat and muriat of lime
5. Sulphat of iron	Alkalies Muriat of barytes Earthy carbonats
6. Muriat of barytes	Sulphats Alkaline carbonats Earthy carbonats
7. Muriat of lime	Sulphats, except of lime Alkaline carbonats Carbonat of magnesia
8. Muriat of magnesia	Alkaline carbonats Alkaline sulphats
9. Nitrat of lime	Alkaline carbonats Carbonats of magnesia and alumina Sulphats, except of lime.

* That is, salts which cannot exist together in solution, without mutual decomposition.

Quantity of real Acid taken up by mere Alkalies and Earths, (*Kirwan.*)

100 *Parts.*	*Sulphuric.*	*Nitric.*	*Muriatic.*	*Carbonic Acid.*
Potash	82,48	84,96	56,3	105, almost.
Soda	127,68	135,71	73,41	66,8.
Ammonia	383,8	247,82	171,	Variable
Barytes	50,	56,	31,8	282.
Strontia	72,41	85,56	46,	43,2.
Lime	143,	179,5	84,488	81,81.
Magnesia	172,64	210,	111,35	200, Fourcroy.
Alumine	150,9			335,nearly,Bergmann.

Quantity of Alkalies and Earths taken up by 100 *parts of real Sulphuric, Nitric, Muriatic, and Carbonic Acids, saturated,* (*Kirwan.*)

100 *Parts.*	*Potash.*	*Soda.*	*Ammonia.*	*Baryt.*	*Strontia.*	*Lime.*	*Mag.*
Sulphuric.	121,48	78,32	26,05	200,	138,		57,92
Nitric.	117,7	73,	40,35	178,12	116,86	55,7	47,64
Muriatic.	177,6	136,2	58,48	314,46	216,21	118,3	898,
Carbonic.	95,1	149,6		354,5	231.+	122,	50,

Table of the respective quantities of Acid and Base required to neutralize each other, calculated by Fischer from Richter's Experiments.

BASES.		ACIDS.	
Alumine . . .	525	Fluoric . . .	427
Magnesia . . .	615	Carbonic . . .	577
Ammonia . . .	672	Sebacic . . .	706
Lime	793	Muriatic . . .	712
Soda	859	Oxalic . . .	755
Strontites . . .	1329	Phosphoric . . .	979
Potash . . .	1605	Formic . . .	988
Barytes . . .	2222	Sulphuric . . .	1000
		Succinic . . .	1209
		Nitric . . .	1405
		Acetic . . .	1480
		Citric . . .	1563
		Tartaric . . .	1694

Table, showing the Maximum Quantity of Oxygen taken up by different Substances.

SIMPLE COMBUSTIBLES.

100 Hydrogen unite with . . .	597.7 Oxygen.
100 Carbon	257.
100 Azote	236.
100 Muriatic acid	194.
100 Phosphorus	154.
100 Sulphur	71.3

METALS.

100 Chrome combine with . . .	200. Oxygen.
100 Iron	92.3
100 Manganese	66.
100 Arsenic	53.
100 Tin	38.8
100 Antimony	30.
100 Zinc, 100 Copper, 100 Lead, 100 Tungsten	25.
100 Mercury	17.6
100 Platina	15.
100 Silver	12.8
100 Bismuth	12.
100 Gold	10.

Table of the Specific Heats of equal Weights of some Bodies compared with Water.

	Crawford.	Dalton's hypothesis.	De La Roche and Berard.
Water . . .	1.000	1.000	1.000.
Atmospheric air . .	1.790	1.759	0.2669
Hydrogen gas . .	21.400	9.382	3.2936
Carbonic acid gas .	1.045	0.491	0.2210
Oxygen gas . .	4.749	1.333	0.2361
Azotic gas . .	0.793	1.866	0.2754
Nitrous oxyd		0.549	0.2369
Nitrous gas		0.777	
Olefiant gas		1.555	0.4207
Carbonic oxyd gas . . .		0.777	0.2884
Steam		1.166	0.8470
Ammoniacal gas . . .		1.555	
Carbureted hydrogen . . .		1.333	
Nitric acid gas		0.491	
Sulphureted hydrogen . . .		0.583	
Muriatic acid gas . . .		0.424	
Ether vapour		0.848	
Alcohol vapour		0.586	

Kirwan's Table, showing the Composition of Salts.

COMPONENT PARTS.

SALTS.	BASIS.	ACID.	WATER.	STATE.
Carbonat of potash	41.	43.	16.	Crystallized.
Pearl-ash	60.	30.	6.	Dry.
Carbonat of soda	21.58	14.42	64.	Fully crystallized.
ditto	59.86	40.05		Desiccated.
barytes	78.	22.		Natural or ignited.
strontian	69.5	30.		Natural or ignited.
lime	55.	45.		Natural if pure, or artificial ignited
magnesia	25.	50.	25.	Crystallized.
common ditto	45.	34.	21.	Dried at 80°.
Sulphat of potash	54.8	45.2		Dry.
soda	18.48	23.52	58.	Fully crystallized.
ditto	44.	56.		Desiccated at 700°.
ammonia	14.24	54.66	31.1	
barytes	66.66	33.33		Natural and pure, artificial ignited
strontian	58.	42.		Natural and pure, artificial ignited
lime	32.	46.	22.	Dried at 66°.
ditto	35 23	50.39	14.38	Dried at 170°.
ditto	88.81	55.84	5.35	Ignited.
ditto	41.	59.		Incandescent.
magnesia	17.	29.35	53.65	Fully crystallized.
ditto	36.68	63.32		Desiccated.
Alum	12 ignited	17.66	51. of crystals + 19.24 in the earth	Crystallized.
Ditto	63.75	32.65		Desiccated at 700°.

Table, showing the composition of Salts,—Continued.

COMPONENT PARTS.

SALTS.	BASIS.	ACID.	WATER.	STATE.
Nitrat of potash	51.8	44.	4.2 of Composition	Dried at 70°.
soda	40.58	53.21	6.21 of Composition	Dried at 400°.
ditto	42.34	57.55		Ignited.
ammonia	23.	57.	20.	
barytes	57.	32.	11.	Crystallized.
strontian	36.21	31.07	32.72	Crystallized.
lime	32.	57.44	10.56	Well dried, that is, in air.
Magnesia	22.	46.	22.	Crystallized.
Muriat of potash	64.	36.		Dried at 80°.
soda	53.	47. aqueous, 38.88 real		Dried at 80°.
ammonia				Crystallized.
ditto	25.	42.75	32.25	Sublimed.
barytes	64.	20.	16.	Crystallized.
ditto	76.2	23.8		Desiccated.
strontian	40.	18.	42.	Crystallized.
ditto	69.	31.		Desiccated.
lime	50.	42.	8.	Red hot.
magnesia	31.07	34.59	34.34	Sensibly dry.

Colour of the Precipitates thrown down from Metallic Solutions by various Re-agents. (*Henry.*)

Metals.	*Prussiated Alkalies.*	*Tincture of Galls.*	*Water impregnated with Sulphureted Hydrogen.*	*Hydrosulphurets.*
Antimony	White	A white oxyd from dilution	Orange	Orange
Arsenic	White	Little change	Yellow	Yellow
Bismuth	White	Orange	Black	Black
Cerium		Yellowish		Brown, becoming deep green
Chrome	Green	Brown		Green
Cobalt	Brownish-yellow	Yellowish-white	Not precipitated	Black
Columbium	Olive	Orange		Chocolate
Copper	Bright reddish brown	Brownish	Black	Black
Gold	Yellowish-white	Solution turned green, precipitate brown of reduced gold	Yellow	Yellow
Iridium	No precip. colour discharged	None; colour discharged		
Iron 1, green salts	White changing to blue	No precipitate	Not precipitated	
Iron 2, red salts	Deep blue	Black		Black
Lead	White	White	Black	Black
Manganese	Yellowish-white	No precipitate	Not precipitated	White
Mercury	White changing to yellow	Orange-yellow	Black	Brownish-black
Molybdena	Brown	Deep-brown	Brown	
Nickel	Green	Greyish-white	Not precipitated	Black
Osmium		Purple, changing to vivid blue		
Palladium	Olive* deep orange†		Dark-brown	Dark-brown
Platina	No precipt.; but an orange one by prussiat of merury	Dark-green becoming paler	Precipitated in a metallic state	
Rhodium	No precipitate			No precipitate
Silver	White	Yellowish-brown	Black	Black
Tantalium				
Tellurium	No precipitate	Yellow		Blackish
Tin	White	No precipitate	Brown	Black
Titanium	Grass-green with some brown	Reddish-brown	Not precipitated	Grass-green
Tungsten				
Uranium	Brownish-red	Chocolate		Brownish-yellow
Zinc	White	No precipitate	Yellow	White

* Chenevix. † Wollaston.

Table of the Solubility of Saline and other Substances, in 100 parts of Water, at the temperature of 60° *and* 212°

	60°	212°
ACIDS.		
Sulphuric	unlimited	unlimited
Nitric	do.	do.
Acetic	do.	do.
Prussic	do.	do.
Phosphoric, Tartaric, Malic, Lactic, Laccic — very soluble.		
Arsenic	150	
Arsenious	1.25	6.
Citric	133	200
Oxalic	50	100
Gallic	8.3	66
Boracic	2.8	8
Mucic	0.84	1.25
Succinic	4 / 1.04	50
Suberic	0.69	50
Camphoric	1.04	8.3
Benzoic	0.208	4.17
Molybdic		0.1
Chromic, unknown		
Tungstic, insoluble		
SALIFIABLE BASES.		
Potass	50	more
Soda, somewhat less than potass		
Baryta	5	50
crystallized	57	unlimited
Strontia	0.6	
crystallized	1.9	50
Lime	0.2	
SALTS.		
Sulphat of potass	6.25	20
Supersulphat of potass	50	100+
Sulphat of soda	37.4	125
ammonia	50	100
magnesia	100	133
alumina, very soluble, proportion unknown		
Supersulphat of alumina and potass / ammonia — alum	5	133
Nitrat of baryta	8.	25
potass	14.25	100+
soda	33	100
Nitrat of strontia	100	200
lime	400	any quantity

	Temperature at 60°	212°
Nitrat of ammonia	50	200
magnesia	100	100+
Muriat of baryta	20	
potass	33	
soda	35.42	36.16
strontia	150	any quantity
lime	200	
ammonia	33	100
magnesia	100	
Oxymuriat of potass	6	40
Phosphat of potass, very soluble		
soda	25	50
ammonia	25	25+
magnesia	6.6	
Sub-borat of soda	8.4	50.
Carbonat of potass	25	83.3
soda	50	100+
magnesia	2	
ammonia	50+	100
Acetat of potass	100	
soda	35	
ammonia, very soluble		
magnesia, ditto		
strontia		40.8
Supertartrat of potass	1.67	3.3
Tartrat of potass	25	
and soda	25	
Oxalat of potass	33	
ammonia	4.5	
Super-oxalat of potass		10
Citrat of potass, very soluble		
Prussiat of potass and iron		
Nitrat of silver, very soluble		
Muriat of mercury (corrosive sublimate)	5	50
Sulphat of copper	25	50
Acetat of copper, very soluble		
Sulphat of iron	50	133
Muriat of iron, very soluble		
Tartrat of iron and potass		
Acetat of mercury		
Sulphat of zinc	44	44+
Acetat of zinc, very soluble		
lead (Ed. Pharm.) Bostock	27	
as it exists in Goulard's extract, more sol.		
Tartrat of antimony and potass, Duncan	6.6	83
Alkaline soaps, very soluble		
Sugar	100	any quantity
Gum, very soluble		
Starch,	0	very soluble

	Temperature at 60°	
Jelly	sparingly	abundantly
Gelatine	soluble	more so
Urea, very soluble		
Cinchonin		

Salts not soluble in 100 times their weight of Water.

Sulphats of baryta, strontia, and lime, and subsulphat of mercury.
Phosphats of baryta, strontia, lime, magnesia, and mercury.
Fluat of lime.
Carbonats of baryta, strontia, and lime.
Muriats of lead and silver, and submuriat of mercury (Calomel).
Subacetat of copper.

Solubility of Saline and other Substances in 100 parts of Alcohol, at the temperature of 176°

All the acids, except the sulphuric, nitric, and oxymuriatic, which decompose it, and the phosphoric and metallic acids.
Potass, soda, and ammonia, very soluble.
Red sulphat of iron.

Muriat of iron	100
lime	100
Nitrat of ammonia	89.2
Muriat of mercury	88.3
Camphor	75.
Nitrat of silver	41.7
Refined sugar	24.6
Muriat of ammonia	7.1
Arseniat of potass	3.75
Nitrat of potass	2.9
Arseniat of soda	1.7

Muriat of soda (Mr. Chenevix.) Alkaline soaps. Magnesian do. Extractive. Tannin. Volatile oils. Adipocire. Resins. Urea. Cinchonin.

Substances insoluble in Alcohol.

Earths.
Phosphoric and metallic acids.
Almost all the sulphats and carbonats.
The nitrats of lead and mercury.
The muriats of lead, silver and soda.
The sub-borat of soda.
The tartrat of soda and potass, and the supertartrat of potass.
Fixed oils, wax, and starch.
Gum, caoutchouc, suber, lignin, gelatin, albumen, and fibrin

Table of Absorption of Gases in 100 parts of Water at 60° F.

	Volume.	
Nitric acid	361000.	
Muriatic acid	51500.	Thomson.
Ammonia	47500.	Davy.
———	78000.	Thomson.
Sulphurous acid	12109.	Fourcroy.
———	3300.	Thomson.
———	1440.	Priestley.
Carbonic acid	108.	Henry.
Sulphureted hydrogen	108.	Henry.
Nitrous oxyd	86.	Henry.
Olefiant gas	12.5	Dalton.
Nitric oxyd	5.	Henry.
Oxygen	3.7	Henry.
Phosphureted hydrogen	2.14	Henry.
Carbonic oxyd	2.01	Henry.
Hydrogen	1.61	Henry.
Nitrogen	1.53	Henry.
Carbureted hydrogen	1.40	Henry.

Table of Efflorescent Salts (Cadet de Vaux.)

288 grains of	in days	lost grains.
Sulphat of soda	61	203
Phosphat of soda	39	91
Carbonat of soda	51	86

Table of Deliquescent Salts (Cadet de Vaux.)

288 grains of	in days	absorbed.
Acetat of potass	146	700
Muriat of lime	124	684
——— manganese	105	629
Nitrat of manganese	89	527
——— zinc	124	495
——— lime	147	448
Muriat of magnesia	139	441
Nitrat of copper	128	397
Muriat of antimony	124	388
——— alumina	149	342
Nitrat of alumina	147	300
Muriat of zinc	76	294
Nitrat of soda	137	257
——— magnesia	73	207
Acetat of alumina	104	202
Supersulphat of alumina . . .	121	202

288 grains of	in days	absorbed
Muriat of bismuth	114	174
Superphosphat of lime . . .	93	165
Muriat of copper	119	148

Composition of some Organic Bodies, according to Berzelius.

	Oxyg.	Hydr.	Carb.	Oxyg.	Hydr.	Carb.	Capacity of saturation.
Benzoic acid	1 *o* +	3*h* +	5*c*	20.02	5.27	74.71	6.69
Gallic acid	1 *o*	2*h*	2*c*	38.02	5.02	56.96	12.34
Tannin from galls	2 *o*	3*h*	3*c*	45.00	4.45	50.55	3.718
Succinic acid	3 *o*	4*h*	4*c*	47.923	4.218	47.859	15.9743
Acetic acid	3 *o*	6*h*	4*c*	46.934	6.195	46.871	15.63
Sugar of milk	4 *o*	8*h*	5*c*	48.348	6.385	45.267	
Sugar	10 *o*	21*h*	12*c*	49.083	6.802	44.115	9.98
Potatoe starch	6 *o*	13*h*	7*c*	49.583	7.090	43.327	
Gum Arabic	12 *o*	24*h*	13*c*	51.456	6.792	41.752	
Citric acid	1 *o*	1*h*	1*c*	55.096	3.634	41.270	13.585
Tartaric acid	5 *o*	5*h*	4*c*	59.200	3.912	36.888	11.976
Saclactic acid	4 *o*	5*h*	3*c*	60.818	5.018	34.164	7.66
Oxalic acid*	6 *o*	1*h*	4*c*	66.534	0.244	33.222	22.

* Oxalic acid 3 *o* + 1 *h* + 2 *c* 64.739 2.848 32.413 Dr. Thomson.

Composition of some Organic Bodies, according to Gay Lussac and Thenard.

	Carbon.	Oxygen.	Hydrogen.	Nitrogen.
Wax	81.79	5.54	12.67	
Olive oil	77.21	9.43	13.36	
Copal	76.81	10.61	12.58	
Rosin	75.94	13.34	10.72	
Oak wood	52.53	41.78	5.69	
Beech wood	51.45	42.73	5.82	
Fecula	43.55	49.68	6.77	
Sugar	42.47	50.63	6.90	
Gum Arabic	44.23	50.84	6.93	
Sugar of milk	38.825	53.834	7.341	
Acetic acid	50.22	44.15	5.63	
Citric acid	33.81	59.86	6.33	
Tartaric acid	24.05	69.32	6.53	
Mucous acid	33.69	62.67	3.62	
Oxalic acid	26.57	70.69	2.74	
Gelatin	47.881	27.207	7.914	16.998
Albumen	52.883	23.872	7.540	15.705
Fibrin	53.360	19.865	7.021	19.934
Cheese	59.781	11.409	7.429	21.381

HEAT.

Correspondence between different Thermometers. (With a Plate.)

Fahrenheit's thermometer is universally used in Great Britain, and for the most part throughout the United States. In it the range between the freezing and boiling points of water is divided into 180 degrees; and as the greatest possible degree of cold was supposed to be that produced by mixing snow and muriat of soda, it was made the zero, hence the freezing point became 32°, and the boiling point 212°.*

The Centigrade thermometer places the zero at the freezing point, and divides the range between it and the boiling point into 100°. This has long been used in Sweden under the title of Celsius's thermometer.

Reaumur's thermometer, which was formerly used in France, divides the space between the freezing and boiling of water into 80°, and places the zero at the freezing point.

Wedgewood's pyrometer is only intended to measure very high temperatures. Its zero corresponds with 1077° of Fahrenheit's, and each degree of Wedgewood is equal to 130 of Fahrenheit.

De Lisle's thermometer is used in Russia. The graduation begins at the boiling point, and increases towards the freezing point. The boiling point is marked 0, and the freezing point 150.

Therefore $180° \text{ F} = 100° \text{ C} = 80° \text{ R} = 150° \text{ D} = \frac{18}{13}\text{W}$, or $= \frac{180}{62.5}\text{W}$.

Formulæ.

1, To reduce centigrade degrees to those of Fahrenheit, multiply by 9 and divide by 5, and to the quotient add 32, that is, $\frac{C \times 9}{5} + 32 = F$.

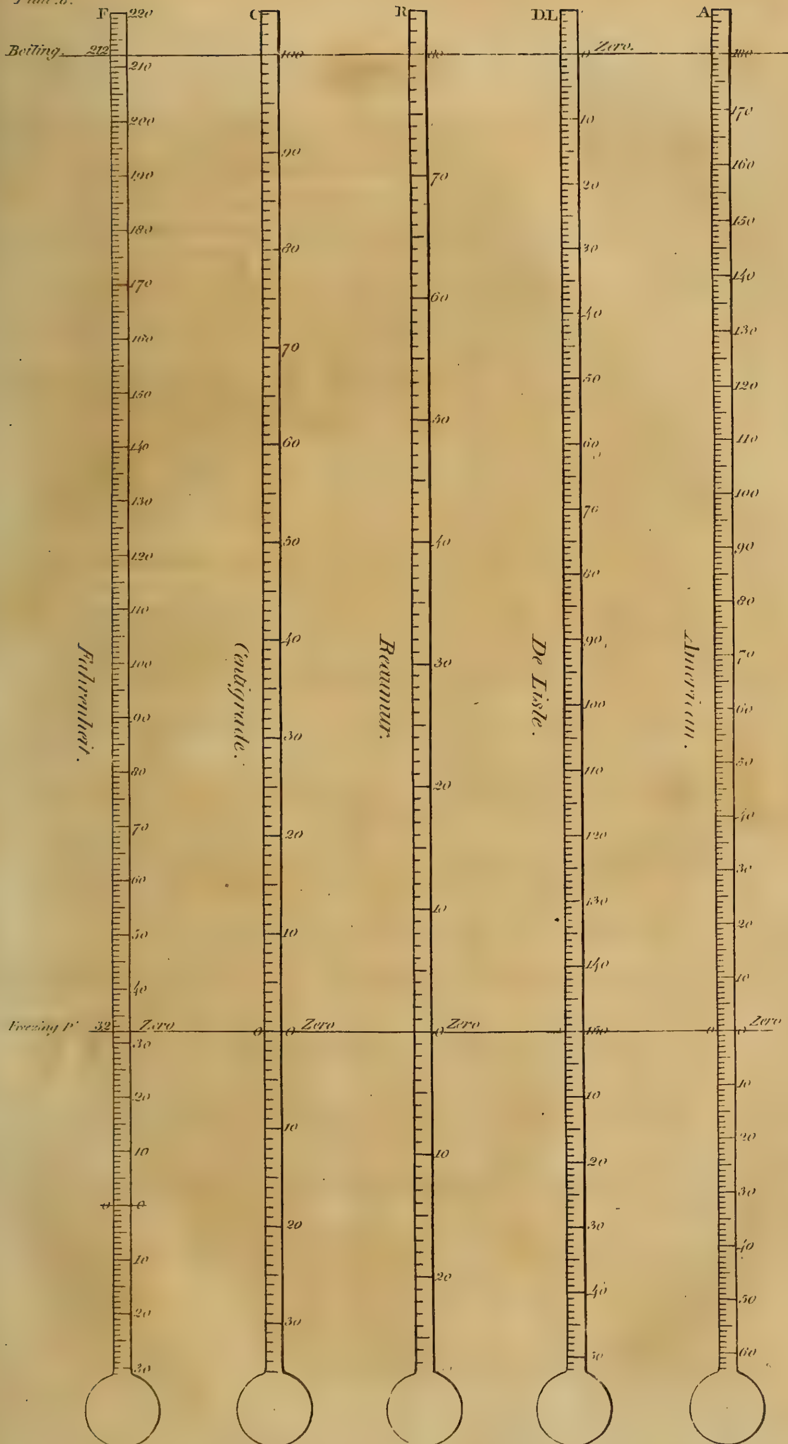
2, To reduce Fahrenheit's degrees to centigrade, $\frac{F - 32 \times 5}{9} = C$.

3, To reduce Reaumur's to Fahrenheit's $\frac{R \times 9}{4} + 32 = F$.

4, To convert Fahrenheit to Reaumur, $\frac{F - 32 \times 4}{9} = R$.

* The freezing point would appear to be the most natural commencement of the scale of zero: and here we find both Reaumur's and the Centigrade Thermometer coincide. In fact, this is a very incorrect mode of determining the zero, as a reference to tables of freezing mixtures will show. Equal parts of snow and muriat of soda, sink the mercury to 0, whilst two of snow and one of the salt, carry it 5° lower. The present range of 180° between the freezing and boiling points, is a very convenient one for the regular division of the scale; and it will also facilitate the reduction of the various scales to each other. I have several times adapted this scale to thermometer tubes, and cannot but wish it was in general use. I shall take the liberty to call it the American Thermometer.

Plate. 8.


F
C
R
D.L
A
Boiling. 212
Zero.
Freezing P^t 32
Zero
Fahrenheit.
Centigrade.
Reaumur.
De Lisle.
American.

5, To reduce De Lisle's degrees under the boiling point, we have $212 - \frac{D \times 6}{5} = F$. To reduce those above the boiling point, $212 + \frac{D \times 6}{5} = F$.

6, And, inversely, to reduce Fahrenheit's degrees to De Lisle's, under the boiling point $\frac{1060 - F \times 5}{6} = - D$; above the boiling point $\frac{F \times 5 - 1060}{6} = + D$.

7, To reduce Wedgewood's degrees to those of Fahrenheit, $W \times 130 + 1077 = F$; or according to Guyton Morveau, $\frac{F - 517.579}{62.5} = W$.

8, Inversely, to reduce Fahrenheit to Wedgewood, $\frac{F - 1077}{130} = W$.

TOXICOLOGICAL TABLES,

In which are exhibited at one view, the Symptoms, Treatment, and Modes of Detecting the Various

POISONS,

MINERAL, VEGETABLE, AND ANIMAL;

ACCORDING TO THE LATEST EXPERIMENTS AND OBSERVATIONS.

BY A MEMBER OF THE ROYAL COLLEGE OF SURGEONS IN LONDON.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
ARSENIC. *Arsenious Acid,* or *White Arsenic.* *Orpiment,* or *Yellow Arsenic.* *Realgar,* or *Red Arsenic.*	An austere taste, fetid breath, ptyalism, constriction of the pharynx and œsophagus, hiccup, nausea, and vomiting of brown or bloody matter; anxiety and faintings, heat and violent pain at the pit of the stomach; stools black and offensive; pulse small, frequent, and irregular; palpitations; great thirst and burning heat; breathing difficult; urine scanty, red, and bloody; delirium, convulsions of an epileptic character, and death.	Vomiting to be excited or encouraged by large draughts of sugared water, linseed tea, or other emollient fluids. Lime water, or chalk and water, may be drank freely, if the arsenic has been taken *in solution.* Fat, oil, vinegar, charcoal powder, alkaline sulphurets, and vegetable decoctions, which have been recommended, are worse than useless. Inflammatory symptoms are to be combated by bleeding from the arm, and by leeches; fomentations, frequent emollient glysters, and other remedies as symptoms may demand. No *specific* antidote yet known.	The ammoniacal sulphat of copper added to solutions of arsenic, produces for the most part a beautiful grass green precipitate, but if dissolved in wine, the precipitate would be blackish blue. Sulphureted hydrogen precipitates arsenic from tea of a beautiful yellow colour. From albumen, gelatin, and bile containing arsenic in solution; nitrat of silver produces a white precipitate. The ammoniaco-nitrat of silver produces a yellow precipitate, soluble in nitric acid and ammonia; but the presence of muriats, or phosphats, or their acids, renders this test fallacious. The most certain test is the reduction of the metal, by calcining the dried suspected matter in a glass tube, with equal parts of charcoal and potash, when, if arsenic be present in very minute quantity, it will be sublimed and adhere to the inside of the tube, in the form of a shining metallic coating.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
ANTIMONY. *Tartarised Antimony,* or *Emetic Tartar.* *Muriat of Antimony,* or *Butter of Antimony.* *Vitrified Oxyd,* or *Glass of Antimony.*	Similar to those occasioned by acids, with abundant and obstinate vomitings, copious stools, constriction of the throat, cramps, symptoms of intoxication, and prostration of strength.	Vomiting to be *excited* by tickling the throat with a feather or the finger, and by large draughts of mild fluids; or *allayed* by opium according to the previous effect of the poison. The best antidotes are, decoctions of astringent vegetables, such as oak or willow bark, or gall nuts, strong tea, &c.	Tartarised antimony is precipitated from its solution of an orange or deep brownish red colour by sulphureted hydrogen and the hydro-sulphurets; white, by sulphuric acid, alkalies, lime, and barytes waters. Alkaline and earthy *neutral* salts do not affect it, but salts with excess of acid do. Infusion of galls occasions a copious whitish yellow precipitate. The muriat is a dark heavy fluid, to which, if water be added, a white precipitate is formed. The oxyd is soluble in muriatic acid, forming the muriat. All the preparations of antimony are readily reduced to the metallic state by calcination with charcoal and potash.
BISMUTH. *The Nitrat.* *The Oxyd,* or *Flake White,* or *Face Powder.*	Similar to those of other corrosive poisons, with great heat in the chest and very difficult breathing.	No specific antidote known. Milk and mild mucilaginous fluids to be drank plentifully to facilitate vomiting, and purgatives should be given.	The nitrat boiled with distilled water is decomposed; part being precipitated as a *sub* nitrat, and part remaining dissolved, being a *super* nitrat; this solution is colourless, reddens litmus paper, and the hydro-sulphurets produce a black insoluble sulphuret of bismuth. The *sub* nitrat is soluble with a little heat in nitric acid, from which the alkalies precipitate the white oxyd, which is easily reduced by calcination.
COPPER. *The Sulphat,* or *Blue Vitriol.* *The sub-Acetat,* or *Verdigris.* *Food cooked in foul Copper vessels, and Pickles made green by Copper.*	Taste acrid and coppery; tongue dry and parched; constriction of the throat and coppery eructations; severe vomitings, or fruitless efforts to vomit; dragging at the stomach, dreadful colic; frequent black bloody stools, with tenesmus; abdomen distended, pulse small, hard, and quick; syncope, great thirst and anxiety; cold sweats, scanty urine, cephalalgia, vertigo, cramps, convulsions, death.	Large draughts of milk and water to encourage vomiting. Whites of eggs stirred up with water and taken freely. Inflammatory consequences to be subdued on general principles, and the nervous symptoms by anodynes and antispasmodics. Sugar is *not* a specific antidote.	The salts of copper are mostly of a bright green or blue colour, and are easily reduced by charcoal at an elevated temperature. The sulphat is partly decomposed by alkalies and alkaline earths. Potash precipitates a *sub*-sulphat of a green colour from it. Ammonia added to a solution of any cupreous salt, gives a blue or greenish precipitate, according to the quantity; but if added in excess, it re-dissolves the precipitate, and forms a deep blue transparent solution.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
GOLD. *The Muriat.* *Fulminating Gold.*	Probably like those of other corrosive poisons, but not known.	No specific antidote known, but vomiting should be excited or encouraged by large draughts of warm mucilaginous fluids.	Muriat of gold is decomposed by nitrat of silver. A muriat of silver is precipitated of a reddish brown colour, owing perhaps to some oxyd of gold being carried down with it. Ammonia added to the precipitate dissolves all the muriat of silver, and leaves the oxyd of gold of a beautiful canary yellow colour. Tin added to the solution of gold forms the purple powder of cassius.
SILVER. *Nitrat,* or *Lunar Caustic.*	Similar to those occasioned by other corrosive poisons.	A table spoonful of common salt to be dissolved in a pint of water, and a wine glass-full to be taken every five minutes, to decompose the poison; after which mucilaginous drinks may be given, or purgatives may be administered.	Nitrat of silver is precipitated white by muriat of soda; yellow, by phosphat and chromat of soda; if placed on burning coals, it animates them, leaving a coating of silver; calcined with charcoal and potash the silver is reduced to its metallic state.
TIN. *Muriat,* *Used by Dyers.* *Oxyd,* or *Putty Powder.*	Taste austere, metallic, constriction of the throat, vomitings with pain over the whole abdomen; copious stools, pulse small, hard, and frequent; convulsive movements of the extremities and face; sometimes paralytic, and mostly death.	Milk to be given; first in large quantities to distend the stomach and produce vomiting, and afterwards to decompose the remains of the poison.	The muriat precipitates gold from its solution of a purple colour; it is itself precipitated of a bright yellow colour by strong tea or alcoholic infusion of galls. Albumen and gelatin occasions a copious flocculent precipitate. The oxyd may be volatilized by heat, is soluble in nitric acid, combines with earths by fusion, and with fixed alkalies forms enamel; it is easily reduced by calcination.
ZINC. *Sulphat,* or *White Vitriol.* *Oxyd.*	An acerb taste, a sensation of choaking, nausea and vomiting, pain in the stomach, frequent stools, difficult breathing, quickened pulse, paleness of face, coldness of the extremities; but seldom death, owing to the emetic quality of the poison.	Vomiting, which is the usual consequence of large doses of sulphat of zinc, to be rendered easy by draughts of warm water, and particular symptoms to be met by appropriate remedies.	The pure sulphat is precipitated white by potash and ammonia; yellowish white by the alkaline hydro-sulphurets, and of an orange colour by the chromat of lead. The oxyd is readily reduced by calcination with charcoal and nitre.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
LEAD. *Super-Acetat, or Sugar of Lead.* *Red Oxyd, or Red Lead.* *Carbonat,* or *White Lead.* *Wines sweetened by Lead.*	When taken in large quantity, a sugary astringent metallic taste; constriction of the throat, pain in the region of the stomach, obstinate, painful, and often bloody vomitings, hiccup, convulsions, and death. When taken in small long continued doses, it produces colica pictonum, and paralytic symptoms.	The same as that recommended for the salts of barytes.—*Vide Alkaline Earths.*	All the preparations of lead are easily reduced to the metallic state by calcination with charcoal. The super-acetat dissolved in water is precipitated white by sulphuric acid; of a canary yellow colour by chromat of potash and chromic acid; these precipitates being easily reduced by calcination. The alkaline sulphurets precipitate the super-acetat of lead of a blackish colour.
MERCURY. *Oxy-Muriat,* or *Sublimate.* *Nitric Oxyd,* or *Red Precipitate.* *Sulphuret,* or *Vermilion.*	Acrid metallic taste, thirst, fulness, and burning at the throat; anxiety, tearing pains of the stomach and bowels; nausea and vomiting of various coloured fluids, sometimes bloody; diarrhœa and dysuria. Pulse quick, small and hard; faintings, great debility, difficult breathing, cramp, cold sweats, insensibility, convulsions and death.	Whites of eggs to be mixed with water, and one to be given every two or three minutes to promote vomiting, and to lessen the virulence of the poison. Milk in large quantities, gum water, or linseed tea, sugar and water, or water itself at about 80°. Inflammatory consequences to be anticipated, and to be subdued by the usual remedies.	Mercurial preparations heated to redness in a glass tube with potash, are decomposed, the quicksilver being volatilized. The oxymuriat is precipitated white by ammonia, yellow by potash, and of an orange colour by lime water; by nitrat of tin a copious dark brown precipitate is formed, and by albumen mixed with cold water, a white flocculent one. The red and nitric oxyds may be dissolved in muriatic acid, and converted into sublimate. Vermilion is insoluble in water or muriatic acid; but is entirely volatilized by heat.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
ACIDS. *Sulphuric,* or *Oil of Vitriol.* *Nitric,* or *Aqua Fortis.* *Muriatic,* or *Spirit of Salt.* *Oxalic,* or *Acid of Sugar.* *Phosphoric.* *Fluoric.* *Tartaric.*	Acid burning taste, acute pain in the throat, stomach, and bowels, frequent vomiting of bloody fluid, which effervesces with chalk or alkaline carbonats, and reddens litmus paper; hiccup, copious stools, more or less bloody; tenderness of the abdomen; difficult breathing, irregular pulse, excessive thirst, drink increasing the pain, and seldom staying down; frequent but vain efforts to make water; cold sweats, altered countenance, convulsions, and death.	Mix an ounce of calcined magnesia with a quart of water, and give a glass-full every two minutes. Soap or chalk and water may be used till magnesia can be procured. Carbonated alkalies are objectionable, on account of the great extrication of gas in the stomach, and the salts formed with them are too irritating for the stomach. Vomiting is to be excited by tickling the throat. Diluents to be taken after the poison is got rid of, and the return to solid food must be very gradual. Inflammatory and other consequences to be treated by the usual remedies. If the vitriolic acid has been swallowed, water alone should not be given, nor should calcined magnesia with water be given; but the common carbonat of magnesia may be given freely when mixed with water. There is too much heat generated in the stomach if the above cautions be not attended to.	Sulphuric acid is known by its great weight, by evolving heat when mixed with water; by emitting no fumes. If barytes be added to it a sulphat is formed, which is insoluble in water or nitric acid. Nitric acid emits orange coloured fumes upon adding copper to it, and is changed blue by it; if potash be added a nitrat is formed which deflagrates when thrown on burning coals. It tinges the skin yellow. Muriatic acid emits pungent fumes; if nitrat of silver be added to it, a very white precipitate is formed of muriat of silver, soluble in ammonia, but not in nitric acid. Oxalic acid precipitates lime and all its salts from water, the precipitate being soluble in nitric, but not in excess of oxalic acid. Exposed to heat it volatilizes, leaving but little residue; it is decomposed by sulphuric acid becoming brown; it is dissolved by heat and nitric acid, and rendered yellow; muriatic acid dissolves it with heat and decomposes it. Phosphoric acid precipitates barytes and lime waters, the precipitate being soluble in nitric acid; it is decomposed by charcoal at a high temperature, evolving carbonic acid and phosphorus being sublimed. Fluoric acid exhales white vapours, not unlike those of muriatic acid; heat is evolved with a hissing noise when water is added to it; it dissolves glass. Tartaric acid produces a precipitate from lime water, soluble in an excess of acid, and in nitric also; with potash it forms a *neutral* and a *super*-salt; it does not precipitate solution of silver, but its salts do.
Prussic.	The most virulent of poisons, producing almost instant death, when applied even in small quantities to the surface of the body.	If prussic acid has been taken, emetics are to be given with as little delay as possible, and after their operation oil of turpentine, ammonia, brandy, and other stimulants capable of rousing the system, should be perseveringly employed with warmth, friction, and blisters.	Prussic acid has a strong odour of bitter almonds, and is contained in that fruit, and in the leaves of the peach and the laurel; it is soluble in alcohol, but hardly in water, and is precipitated from its solution by nitrat of silver.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
ALKALIES, Caustic or Carbonated. *Potash.* *Soda.* *Ammonia.*	The taste acrid, urinous, and caustic; great heat in the throat; nausea and vomiting of bloody matter, which changes syrup of violets to green, and effervesces with acids if the carbonated form of the alkali has been taken; copious stools, acute pain of the stomach, colic, convulsions, derangement, and death.	Vinegar and other vegetable acids to be given largely, to neutralize the poison, and the consequent symptoms to be treated on general principles.	Alkalies have many properties in common; their solutions feel soapy to the touch; change to green, vegetable reds and blues, and yellows to brown; remain transparent when carbonic acid is added to them, which distinguishes them from solutions of the alkaline earths, barytes, strontian and lime. Nitrat of silver is precipitated by them in form of a dark coloured oxyd, soluble in nitric acid. Potash and soda may be distinguished from each other by evaporating their solutions to dryness; potash will become moist by absorbing water from the air, while soda will remain dry. Ammonia is known by its pungent smell.
ALKALINE EARTHS. *Lime.* *Pure Barytes.* *Carbonat.* *Muriat.*	Violent vomitings, convulsions, palsy of the limbs, distressing pains in the abdomen, hiccup, alteration of the countenance, and very early death.	If lime has been taken, vinegar and other vegetable acids are the best antidotes. If barytes in any of its forms has been swallowed, a weak solution of epsom or glauber's salt should be drank plentifully, to produce vomiting, and at the same time to decompose the poison, which it renders inert by forming an insoluble sulphat. Till the above salts can be had, large draughts of well water alone, or made slightly sour by sulphuric acid, may be drank pretty freely.	Solution of lime changes vegetable blues to green, and is precipitated white by carbonic and oxalic acid, while no change is produced on it by sulphuric acid; its salts are decomposed by the *fixed* alkalies which precipitate the lime, but not by ammonia. Pure barytes undergoes changes similar to lime when water is added to it, and acts like it on vegetable colours; it does not effervesce with acids. Sulphuric acid, and all the sulphats added to a solution of it, produce a white precipitate, insoluble in water and nitric acid. Carbonat of barytes is insoluble in water, but dissolves in nitric or muriatic acid, with effervescence. Muriat of barytes dissolved in water, is not changed by pure ammonia, but its carbonat, as well as all other alkaline carbonats, throw down a white precipitate, which is carbonat of barytes.
Nitre, or *Salt Petre.*	Cardialgia, nausea, painful vomiting, purging, convulsions, syncope, pulse feeble, extremities cold, with tearing pains of the stomach and bowels; difficult respiration, a kind of intoxication, and death.	Similar to that of arsenic, except that lime is not to be used.	If the nitre be thrown on burning coals, it crackles, and gives a beautiful white flame; if powdered, and sulphuric acid be poured upon it, it gives out white vapours; both these circumstances distinguish it from glauber's salt. It is decomposed at a high temperature, affording oxygen gas.

MINERAL POISONS.

POISONS.	SYMPTOMS.	TREATMENT.	TESTS.
Muriat Of Ammonia, or *Sal Ammoniac.*	Excessive vomitings, with convulsions and general stiffness of the muscles, great pain in the bowels, early alteration of the features, and death.	Vomiting to be rendered easy by large draughts of warm sugared water, and if not occasioned by the poison, should be excited hy the finger. The consequent nervous symptoms to be calmed by anodynes and antispasmodics, and inflammatory ones counteracted by the usual means.	Muriat of ammonia is soon volatilized if placed on hot coals; if rubbed with quick lime, it gives out the odour of hartshorn. A solution of it in water is precipitated white upon the addition of nitrat of silver.
Phosphorus.	Occasions symptoms similar to those of concentrated acids.	No specific antidote is known, but vomiting should be excited by large draughts of water, and oil or fatty substances should be avoided.	If phosphorus, or the rejected contents of the stomach, after it has been taken, be boiled in a retort, having its beak under water, with a solution of caustic potash, phosphureted hydrogen gas is formed, which explodes with a green flame as soon as it reaches the surface of the water.
Glass or *Enamel.*	If taken in very coarse powder, it produces irritation and inflammation of the bowels.	Large quantities of crumb of bread should be eaten, to envelope the particles. An emetic of sulphat of zinc should then be given, and vomiting promoted by demulcent drinks.	
AL COHOL. *Brandy. Wines, and al Spirituous Liquors.*	Intoxication, and when taken very freely, complete insensibility, with apoplexy or paralysis of one side; the countenance is swollen, and of a dark red colour; the breathing is difficult, and often stertorous, with a peculiar puffing out of the lips; the breath smells of liquors, which will distinguish the symptoms from those of spontaneous apoplexy.	A powerful emetic of white vitriol, or tartar emetic, should be got into the stomach as soon as possible, and if the person has lost the power of swallowing, a flexible catheter or tube should be the means of conveying it there. The vomiting should be encouraged as much as possible with warm water, and large and active glysters of salt and water should be thrown up. The patient should be placed erect, and if the countenance and other appearances are not improved after these means have been used, the jugular vein may be opened, and cold wet cloths applied to the head, particularly if the body is hotter than natural. If the extremities become cold, warmth and friction should be perseveringly used.	

VEGETABLE POISONS.

All the Vegetables marked thus * are Natives of Great Britain.

IRRITATING POISONS.

Aconitum *napellus*	Monks-hood
*Anemone *pulsatilla*	Pasque Flower
*Arum *maculatum*	Wake Robin
*Bryonia *dioica*	Bryony
Callicocca *ipecacuanha*	Ipecacuanha
*Chelidonium *majus*	Celandine
*Clematis *vitalba*	Virgins Bower
*Colchicum *autumnale*	Meadow Saffron
Convolvulus *scammonia*	Scammony
Cucumis *colocynthis*	Bitter Apple
*Daphne *mezereum*	Mezereon
*Daphne *laureola*	Spurge Laurel
Delphinium *staphisagia*	Stavesacre
Euphorbia *officinarum*	Euphorbium
Fritillaria *imperialis*	Crown Imperial
Gratiola *officinalis*	Hedge Hyssop
*Hydrocotile *vulgaris*	Marsh Pennywort
*Helleborus *niger*	Black Hellebore
*Helleborus *fœtidus*	Bears Foot
Juniperus *sabina*	Savine
Lobelia *syphilitica*	Cardinal Flower
Momordica *elaterium*	Elaterium
*Narcissus *pseudo-narcissus*	Daffodil
*Œnanthe *crocata*	Hemlock Dropwort
*Phellandrium *aquaticum*	Water Hemlock
*Pedicularis *palustris*	Louse-wort
*Ranunculus *acris*	Butter Cups
*——— *sceleratus*	Water Crowfoot
*——— *flammula*	Lesser Spear Wort
Rhododendron *crysanthemum*	Yellow Rhododendron
Rhus *toxicodendron*	Poison Oak
Ricinus *major*	Purging Nut
*Sedum *acre*	Wall Pepper
*Sempervivum *tectorum*	Houseleek
Scilla *maritima*	Squill
Stalagmitis *cambogoides*	Gamboge
Veratrum *album*	White Hellebore
*Viola *tricolor*	Hearts Ease

SYMPTOMS.

The general effects of this class of vegetable poisons, are an acrid, pungent taste, with more or less of bitterness, excessive heat, great dryness of the mouth and throat, with sense of tightness in it; violent vomitings, and the efforts are continued even after the stomach is emptied; purging, with great pain in the stomach and bowels; pulse strong, frequent, and regular; breathing often quick and difficult; appearances of intoxication; the pupil of the eye frequently dilated, insensibility resembling death, the pulse becomes slow, and loses its force, and death closes the scene.

If applied externally they, many of them, produce violent inflammations of the skin, with vesications or eruptions of pustules.

TREATMENT.

If vomiting has been occasioned by the poison, and the efforts are still continued, they may be rendered easier by large draughts of warm water, or thin gruel; but if symptoms of insensibility have come on without vomiting, it ought to be immediately excited by the sulphat of zinc, or some other active emetic substance, and after its operation, a sharp purgative should be given. After as much as possible of the poison is got rid of, a very strong infusion of coffee, or vinegar diluted with water, may be given with advantage. Camphor mixture with æther may be taken frequently, and if insensibility be considerable, warmth, frictions, and blisters, may be employed. If inflammation or other dangerous consequeuces have been induced, they are to be treated upon general principles.

The fruit of the Fewillea Cordifolia has been lately recommended as a powerful antidote against vegetable poisons; it is to be used in as recent a state as possible.

VEGETABLE POISONS.

NARCOTIC POISONS.	SYMPTOMS.	TREATMENT.
*Actea *spicata* . . . . Bane berries *Æthusa *cynapium* . . . . . . Fools Parsley *Aristolochia *clematitia* . . . . Birth Wort *Atropa *belladonna* . . . . . . Deadly Night Shade *Cicuta *virosa* . . . . Water Hemlock *Conium *maculatum* . . . . . Hemlock *Datura *stramonium* . . . . . Thorn Apple *Digitalis *purpurea* . . . . . . Fox Glove Ervum *ervilia* . . . . Lentil *Hyosciamus *niger* . . . . Henbane *Lactuca *virosa* . . . . Strong Scented Lettuce Laurus *camphora* . . . . Camphor Laurus *cerasus* . . . . Common Laurel *Lolium *temulentum* . . . . . Darnel Menispermum *coculus* . . . . Coculus Indicus Nicotiana *tabacum* . . . . . . Tobacco *Papaver *somniferum* . . . . Opium *Paris *quadrifolia* . . . . Herb Paris *Solanum *dulcamara* . . . . . Woody Night Shade Strychnos *nux vomica* . . . . Crow Fig	The narcotic vegetable poisons, if taken into the stomach, or applied to a wound, occasion the following effects:—Stupor, numbness, heaviness in the head, desire to vomit, slight at first, but afterwards insupportable; a sort of intoxication, stupid air, pupil of the eye dilated, furious or lively delirium, sometimes pain, convulsions of different parts of the body, or palsy of the limbs. The pulse is variable, but at first generally strong and full: the breathing is quick, and there is great anxiety and dejection, which if not speedily relieved, soon ends in death.	The stomach to be effectually evacuated, by giving four or five grains of tartar emetic, or from ten to twenty of the sulphat of zinc, and repeat it every quarter of an hour, till the full effect is produced. These means may be assisted by tickling the throat with a feather, or the finger. Large and strong glysters of soap dissolved in water, or of salt and gruel, should be speedily administered, to clear the bowels and assist in getting rid of the poison, and active purgatives may be given after the vomiting has ceased. When as much as possible of the poison has been expelled, the patient may drink, alternately, a tea-cup full of strong hot infusion of coffee, and vinegar diluted with water. If the drowsiness, which is sometimes extreme, and the insensibility bordering on apoplexy, be not remedied by these means, blood may be taken from the jugular vein, blisters may be applied to the neck and legs: and the attention roused by every means possible. If the heat declines, warmth and frictions must be perseveringly used. Vegetable acids are on no account to be given *before* the poison is expelled, and it is desirable that but little fluid of any kind should be given.
POISONOUS MUSHROOMS. Agaricus *muscarius* . . . . . . Fly Agaric ——— *piperatus* . . . . . Pepper Agaric ——— *necator* . . . . . . Deadly Agaric ——— *bulbosus* . . . . . . Bulbous Agaric ——— *chantarellus* . . . . . Champignon	Nausea, heat, and pain in the stomach and bowels, with vomiting and purging; thirst, convulsions, and faintings; pulse small and frequent; delirium, dilated pupil and stupor, cold sweats, and death. Poisonous mushrooms may be distinguished from the edible ones by their botanical characters, and by the following criteria. The former grow in wet shady places, have a nauseous odour, are softer, more open and porous; have a dirty looking surface, sometimes a gaudy colour, or many very distinct hues, particularly if they have been covered with an envelope; they have soft bulbous stalks, grow rapidly, and corrupt very quickly.	The stomach and bowels to be first cleared by an emetic of tartarized antimony, followed by frequent doses of Glauber's or Epsom salt, and large stimulating glysters. After the poison is evacuated, æther may be administered with small quantities of brandy and water, but if inflammatory symptoms manifest themselves, such stimuli should be omitted, and other appropriate means had recourse to.

ANIMAL POISONS.

POISONOUS FISH.		SYMPTOMS.	TREATMENT.
Balistes *monoceros*	Old Wife	In an hour or two, or often in a much shorter time, after stale fish have been eaten, a weight at the stomach comes on, with slight vertigo and head-ache, with a sense of heat about the head and eyes, considerable thirst, and often an eruption of the skin (urticaria), and in many cases death has happened.	An emetic should be speedily administered, or in the absence of it, the vomiting may be excited, by tickling the throat with the finger, and taking large draughts of warm water. After full vomiting, an active purgative should be given to remove any of the noxious matter that may have found its way into the intestines. Vinegar and water may be drank after the above remedies have operated, and the body may be sponged with the same. Water made very sweet with sugar, to which æther may be added, may be drank freely as a corrective, and a very weak solution of alkali has been recommended, to obviate the effects of the poison. If spasm ensue, after evacuations, laudanum, in considerable doses, is necessary. If inflammation should occur, the usual means of removing it must be employed.
Cancer *astacus*	Sea Lobster		
——— *ruricolus*	Land Crab		
Clupea *thryssa*	Yellow Billed Sprat		
Coracinus *fuscus major*	Gray Snapper		
Coracinus *minor*	Hyne		
Coryphœna *splendens*	Dolphin		
Mormyra	Blue Parrot Fish		
Meræna *major*	Conger Eel		
Mytilus *edulis*	Mussel		
Ostracion *globellum*	Bottle Fish		
Perca *major*	Barracuda		
Perca *venenosa*	Grooper		
Perca *venenata*	Rock Fish		
Scomber *maximus*	King Fish		
Scomber *thynnus*	Bonetta		
Sparus *chrysops*	Porgee		
Tetrodon *sceleratus*	Tunny		
Tetrodon *ocellatus*	Blower		
POISONOUS SERPENTS.			
Coluber *berus*	Viper	A sharp pain in the wounded part, which soon extends over the limb or body; great swelling, at first hard and pale, then reddish, livid, and gangrenous in appearance; faintings, vomitings, convulsions, and sometimes jaundice; pulse small, frequent, and irregular, breathing difficult, cold sweats, the sight fails, and the intellectual faculties are deranged. Inflammation, and often extensive suppuration and gangrene, followed by death.	A moderately tight ligature to be applied above the bites, and the wound left to bleed after being well washed with warm water; the actual cautery, lunar caustic, or butter of antimony, to be then applied freely to it, and afterwards covered with lint, dipped in equal parts of olive oil and spirit of hartshorn. The ligature to be removed if the inflammation be considerable. Warm diluting drinks, and small doses of ammonia or hartshorn to cause perspiration; to be well covered in bed, and a little warm wine given occasionally. If gangrene be threatened, wine may be given more freely, and the bark should be had recourse to. Arsenic, the principal ingredient in the Tanjore Pill, has been strongly recommended.
Coluber *prester*	Black Viper		
Coluber *naja* Crotalus *horridus* Cobra de *capello*	Rattlesnake		
Coluber *carinatus*			
Gedi Paragoodoo			
Ratuka Rekula Poda			
Rodroo Pam.			

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ANIMAL POISONS.

POISON.	SYMPTOMS.	TREATMENT.
CANTHARIDES. *Spanish*, or *Blistering Fly*.	Nauseous odour of the breath, acrid taste, burning heat in the throat, stomach and belly, frequent vomitings, often bloody, with copious bloody stools; excruciating pain in the stomach; painful and obstinate priapism, with heat in the bladder, and strangury or retention of urine; frightful convulsions, delirium, and death.	Vomiting to be excited by drinking sweet oil, sugar and water, milk, or linseed tea, very freely. Emollient glysters should be administered, and if symptoms of inflammation of the stomach, kidney, or bladder, supervene, they must be subdued by appropriate treatment. Camphor dissolved in oil may be rubbed over the belly, and on the thighs.
VENEMOUS INSECTS. Tarantula Scorpio . . . . Scorpion Vespa *crabro* . . . . Hornet Vespa *vulgaris* . . . . Wasp Apis *mellifica* . . . . Bee Culex *pipiens* . . . . Gnat Oestrus *bovis* . . . . Gad Fly	In general the sting of these insects occasions only a slight degree of pain and swelling; but occasionally the symptoms are more violent, and sickness and fever are produced by the intensity of the pain.	Hartshorn and oil may be rubbed on the affected part, and a piece of rag moistened in the same, or in salt and water, may be kept upon it till the pain is removed. A few drops of hartshorn may be given frequently, in a little water, and a glass or two of wine may be taken. The sting may in general be removed by making strong pressure over it with the barrel of a small watch key.
SALIVA OF THE RABID DOG.	At an uncertain interval after the bite, generally however between the twentieth day and three or four months, pain or uneasiness occurs in the bitten part, though the wound may have been long healed. Anxiety, uneasiness, languor, spasms, horror, disturbed sleep, difficult respiration succeed, and are soon very much increased; violent convulsions affect the whole body, hideously distorting the muscles of the face; the eyes are red and protruded, the tongue swells, and often hangs out, and viscid saliva flows from the mouth; there is pain in the stomach, with bilious vomitings, a horror of fluids, and impossibility of drinking them. All these symptoms are aggravated till the sufferer is relieved by death.	Hydrophobia is more easily prevented than cured, indeed it is doubtful if it ever has been cured. Mercury, arsenic, opium, musk, camphor, acids, wine, vegetable and mineral alkali, oil, various herbs, and many other remedies, whose effects are quite opposite, have been employed, but none can be relied on. Large blood-lettings, the warm and cold bath, and almost every other remedial agent, have been tried without success. The bitten part should be completely cut out, even after it has healed, if the symptoms have not yet come on; the part should then be immersed in warm water, or washed with it as long as it will bleed, and after the most persevering ablution caustic should be applied to every part of the surface, and then the wound covered with a poultice, and suffered to heal by granulations. No milder discipline can ensure safety.

MISCELLANEOUS.

☞ Mr. Gray, of London, in his Supplement to the Pharmacopœia, has embodied a vast collection of matter, which is more or less connected with the Materia Medica. It has been thought advisable to extract from it considerably, as it may prove useful to a numerous class of readers.

" *Stuffed animals for specimens.*—The animal being carefully embowelled, the opening for that purpose being made in some place that will be out of sight, as, for example, under the wings of birds, gashes cut in the remaining flesh, and the brain extracted by a wire; the whole of the inside is washed with a ley of common soda, then dried with tow, and afterwards the inside is done over, by means of a brush, with *Bécœur's arsenical soap,* which is prepared by melting thirty-two ounces of soap in a little water, adding twelve ounces of salt of tartar, and four ounces of quicklime, then mixing with these thirty-two ounces of white arsenic, and five ounces of camphor previously rubbed down with a little spirit of wine; more water is then added to form the whole into a thin gruel: this illinition drives away insects. Larger animals are usually merely skinned: the internal cavity is then filled with tow, shred tobacco, straw, or this powder: Tobacco and powder of black pepper, of each, one pound; flowers of sulphur, and sal prunellæ, of each, eight ounces; burnt alum, four ounces; to which may be added an ounce of corrosive sublimate. Animals have also been preserved by embowelling and keeping them for some time in a solution of corrosive sublimate, then hanging them up to dry in the air, and simply stuffing them with tow, which has been dipped in the same solution. Fish are sometimes skinned, the skin is then drawn over a mould made of clay, or plaster of paris, and varnished with spirit varnish. False eyes are made for these specimens, by dropping some black sealing-wax upon a piece of card, cut a little larger than the size of the natural eye. For large eyes, common glazier's putty may be used, and when dry, painted of any required colour. Baking is not only useful in fresh specimens, but it should be a constant practice to bake them over again once in two or three years, and to have the cases washed with camphorated spirit of wine, or a solution of corrosive sublimate.

Insects for specimens.—The hard-shelled winged insects to be pinned through the left wing, so that the pin may pass just under

the first pair of feet: other insects to be pinned through the thorax. As their feet and antennæ generally fold under them, pin them at first upon a slice of cork, pull out the feet and antennæ very carefully, with a small pair of forceps, and fix them in a proper position with pins for two or three days, after which they will retain their situation: if they are already stiff, breathing upon them for a few minutes will relax the muscles. For the sending of them to any distance, stick them in boxes about four inches deep, the top and bottom of which are lined with cork, or soft wax spread between paper, about one-eighth of an inch thick, fixed to the box with glue and small tacks; into each box put a small bag of powdered camphire, or a sponge impregnated with oil of cajeput, or any other strong scented oil. The larger insects must not be put in these boxes, along with small ones, lest they should get loose and break the others during the carriage.

Spiders are best kept in spirit of wine, by pinning them to a skewer of soft wood stuck into the cork of a wide-mouth phial, so as to keep it in the middle; but if they are desired to be kept along with other insects in boxes or drawers, then procure a glass tube, seven or eight inches long, and three-fourths of an inch in diameter, open at both ends, with a cork fitted to one end; as also a splinter of wood sharp at both ends, and so long, that one end may be stuck into the cork, and the other may reach to the middle of the tube. When you catch a spider, pin it through the thorax, put the legs in the right position with pins, as above; cut off the abdomen with scissors, and stick it on the splinter of wood, put it into the tube, and hold this over the flame of a candle, turning it constantly, till the abdomen appears dry and round, then let it cool in the tube, and when cold, cut it off, and fasten it again to the thorax with gum water thickened with starch.

Caterpillars may be preserved in a similar way, by being dried over the fire or candle in a tube; a slit being made by which the inside may be pressed out, and the skin, by means of a blow-pipe, blown up to its proper size again.

Essence of spruce.—Is prepared by boiling the twigs of Scotch fir in water, and evaporating the decoction till it grows thick; used to flavour treacle beer, instead of hops.

Essence of malt.—Is prepared by infusing malt in water (first boiled and then cooled till it reflects the image of a person's face in it) pouring off the infusion, and evaporating it to the consistence of new honey; used in sea voyages, and places where malt cannot be procured to make beer.

Sepia, cuttle fish ink.—When fresh taken from the cuttle fish, it is a black glary liquid, of a viscid consistence, a peculiar fishy smell, and very little taste; it is preserved for use by being spread round saucers or gallipots, so as to dry before putrefaction commences; used for writing ink, and for a paint, much superior in ease of working to Indian ink, which latter dries so quick, that it is difficult to colour a large pale shadow with it, and when once dry, some part

always adheres to the paper, and cannot be removed, whereas sepia may be washed almost clear off.

Prepared ox gall.—The fresh gall is left for a night to settle, the clear fluid poured off, and evaporated in a water-bath to a proper consistence; used by painters in water colours to destroy the greasiness of some of their colours, and thus enable them to form an even surface of colour; and also instead of soap to wash greasy cloth.

Nut oil. Oleum nucum coryli.—From the kernel of the hazel nut, very fine; substituted for oil of ben: as it will keep better than that of almonds, it has been proposed to be substituted for that oil in the college lists, being nearly equal to it; is drank with tea in China, probably in lieu of cream; used by painters as a superior vehicle for their colours.

Hemp oil. Oleum cannabis.—From hemp seed; good for frying in, used by the painters as a drying oil.

Walnut oil. Ol. nucum juglandis.—Makes good plasters, will not keep; used by painters, is very drying: they yield about half their weight of oil.

Oil of yelks of eggs. Oleum e vitellis ovorum.—Obtained by boiling eggs, so that the yelks may be hard, separating the whites, roasting the yelks, first broken in two or three pieces each, in a frying pan over the fire, till the oil begins to exude out of them, and then pressing them with great force; very emollient; fifty eggs yield about five ounces of oil. Old eggs yield the greatest quantity. Morelot advises to dilute the raw yelks with a large proportion of water, and to add spirit of wine in order to separate the albumen, after which, the oil will rise up to the top by standing some time, and thus may be separated by a funnel.

Cologne Earth, Umber. Terra Coloniensis.—Black, or blackish brown, mixed with brownish red, fine grained, earthy, smooth to the touch, becomes polished by scraping, very light, burns with a disagreeable smell: found near Cologne; used in painting, both in water colours or in oil; used also in Holland, to render snuff fine and smooth: very different from the brown ochre, which is also called Umber, and is not combustible.

Coal tar.—Distilled from fossil coals; used as a coarse cheap varnish, and, when rectified by a fresh distillation with water, sold for oil of amber.

Dippel's oil, animal oil, rectified oil of hartshorn. Ol. Dippelii, ol. animale, ol. cornu cervi rectificatum.—From hartshorn, distilled without addition, rectifying the oil, either by a slow distillation, in a retort &c. no bigger than is necessary, and saving only the first portion that comes over, or with water, in a common still: very fine and thin, and must be kept in an opake vessel, or in a drawer or dark place, as it is quickly discoloured by light; antispasmodic, anodyne, diaphoretic, from ten to thirty drops in water; externally stimulant.

Charcoal. Carbo ligni.—Varies in its qualities according to the wood from which it is prepared: that of the soft woods, as the willow, alder, &c. well burned, is best for crayons, for making gun-

powder, and for clarifying liquids ; that of the harder woods is used for fuel, or for a support for substances exposed to the flame of a blowpipe : the charcoal of the chesnut is employed by the smiths in the south of Europe, on account of its slow consumption when not urged by the blast of the bellows, and of the fire deadening immediately upon the blast being stopped. The charcoal of the holly, if the bark be left on, is believed to render iron brittle when worked by a fire made of it. Charcoal powder is used as a tooth-powder, and in poultices to correct fetid ulcers : that of the areca nut is the most fashionable dentifrice, but is no otherwise preferable to any other soft charcoal.

Frankfort black.—Charcoal made of the lees of wine and vine twigs; used to make printer's ink.

Noir d'Espagne.—Charcoal made of cork burnt in close vessels ; used as a colour in painting.

Ivory black. Ebur ustum.—From ivory shavings burned ; used as a dentifrice and a paint ; rare, bone black being sold for it.

Bone black. Ebur ustum vulgare.—The residuum left in the iron still, after the distillation of bone ; is usually sold under the name of ivory black, and for the same purposes, but especially for making blacking for shoes, &c.

Lamp Black. Fuligo lampadum.—Originally made by suspending a copper bason over a lamp having a long smoking wick ; but now by burning the chips of resinous deals, made from old fir trees in tents, to the inside of which it adheres. The lighter it is the more it is esteemed ; used as a paint.

English coffee.—Wheat, barley, holly berries, acorns, succory root, seeds of gooseberries and currants left in making wine, and washed, and even sliced turnips have been used as substitutes for foreign coffee, and roasted with the addition of a little butter or oil; but they want the agreeable aroma of the foreign : the best substitute is said to be the seeds of the yellow water flag, gladiolus luteus, or iris pseudacorus, which is frequently found by the sides of pieces of water.

Bistre.—From wood soot, by pulverisation, decoction with water, straining the decoction and evaporation, as in making extracts ; an excellent brown water colour, superior to Indian ink for drawings, when they are not intended to be tinted with other colours.

Potatoe starch, common arrow root.—May be made from frozen potatoes in as large a quantity, and as good, as from those which have not been spoiled by the frost ; very white, crimp to the fingers, and colours them ; friable, heavy, sinking in water ; when held towards the light it has shining particles in it ; dissolves in boiling water as easily as true arrow root: 100 pounds of potatoes yield ten pounds of starch.

Almond cake. Amygdalæ placenta.—Left after the expression of the oil.

Ground almond cake, almond powder. Farina amygdalarum.—Used instead of soap for washing the hands.

Carmine. Carminum, Purpura vegetabilis.—Boil one ounce of cochineal, finely powdered, in twelve or fourteen pounds of rain or distilled water, in a tinned copper vessel for three minutes, then add twenty-five grains of alum, and continue the boiling for two minutes longer, and let it cool: draw off the clear liquor as soon as it is only blood warm, very carefully, into shallow vessels, and put them by, laying a sheet of paper over them to keep out the dust, for a couple of days, by which time the carmine will have settled. In case the carmine does not separate properly, a few drops of a solution of tin, i. e. dyers' spirit, or of a solution of green vitriol, will throw it down immediately: the water being then drawn off, the carmine is dried in a warm stove. The first coarse sediment serves to make Florence lake; the water drawn off is *liquid rouge.*

2. Boil one pound of cochineal powdered, and six drachms of alum, in forty pounds of water, strain the decoction, add half an ounce of dyers' spirit, and after the carmine has settled, decant the liquid and dry the carmine: this process yields about one and a half ounces; used as a paint for the ladies, and also by miniature painters.

Brown red. Colcothar vitrioli, Oxidum ferri rubrum.—By re-calcining green vitriol (previously calcined to whiteness) by an intense heat until it becomes very red, and washing the residuum.

Prussian blue. Cœruleum Berolinense.—Red argol and saltpetre, of each two pounds; throw the powder by degrees into a red hot crucible: dry bullock's blood over the fire, and mix three pounds of this dry blood with the prepared salt, and calcine it in a crucible till it no longer emits a flame; then dissolve six pounds of common alum in twenty-six pounds of water, and strain the solution; dissolve also two ounces and a half of dried green vitriol, in two pounds of water, and strain while hot; mix the two solutions together while boiling hot; dissolve the alkaline salt, calcined with blood, in twenty-seven pounds of water, and filter through paper supported upon linen; mix this with the other solution, and strain through linen: put the sediment left upon the linen, while moist, into an earthen pan, and add one pound and a half of spirit of salt; stir the mass, and when the effervescence is over, dilute with plenty of water, and strain again: lastly, dry the sediment.

2. Mix one pound of kali præparatum with two pounds of dried blood, or any dry animal substance; put it into a high crucible, or long pot, and keep it in a red heat till it no longer flames or smokes; then take out a small portion, dissolve it in water, and observe its colour and effects upon a solution of silver in aqua fortis; for, when sufficiently calcined, it will neither look yellowish, nor precipitate silver of a brownish or blackish colour: it is then to be taken out of the fire, and when cool dissolved in a pint and a half of water.

Take green vitriol one part, common alum one to three parts; mix, and dissolve them in a good quantity of water, by boiling, and filter while hot; precipitate this solution by adding a sufficient quantity of the solution of prepared alkali, and filter. The precipitate will be the darker the less alum is added, but at the same time

it will be greener from the greater admixture of the oxyd of iron which is precipitated, and which must be got rid of by adding, while moist, spirit of salt, diluting the mixture with water, and straining.

3. Precipitate a solution of green vitriol with the solution of prepared alkali, and purify the precipitate with spirit of salt; precipitate a solution of common alum with a solution of kali præparatum: mix the two sediments together while diffused in warm water, strain and dry.

Flake white. Cerussa vera, plumbi carbonas, plumbi sub-carbonas, plumbi oxidum album.—Made by suspending rolls of thin sheet lead over vinegar in close vessels, the evaporation from the vinegar being kept up by the vessels being placed in a heap of dung, or a steam bath.

2. By dissolving litharge in dilute nitrous acid, and adding prepared chalk to the solution; astringent, cooling; used externally; also employed as paint, mixed with nut oil.

Patent yellow.—Common salt one hundred weight, litharge four hundred weight, ground together with water, kept for some time in a gentle heat, water being added to supply the loss by evaporation, the natron then washed out with more water, and the white residuum heated till it acquires a fine yellow colour: used as a paint, instead of King's yellow, is not so bright, but does not injure the health of the painters so much as that poisonous colour.

Naples yellow.—Lead one pound and a half, crude antimony one pound, alum and common salt of each one ounce, calcined together. *Passeri.*

2. Flake white twelve ounces, diaphoretic antimony two ounces, calcined alum half an ounce, sal ammoniac one ounce; calcine in a covered crucible, with a moderate heat, for three hours, so that at the end of that it may be barely red hot: with a larger proportion of diaphoretic antimony and sal ammoniac, it verges to a gold colour. *Fougeroux.*

Powder gold. Aurum sophisticum.—Verdigrise eight ounces, tutty four ounces, borax, nitre, of each two ounces, corrosive sublimate two drachms, made into a paste with oil, and melted together; used in japan work as a gold colour.

Scheele's green.—Precipitate a solution of two pounds of blue vitriol, in a sufficient quantity of water, by a solution of eleven ounces of white arsenic, and two pounds of kali ppm. in two gallons of boiling water, and wash the precipitate: used as a paint.

Verditer blue. Azurum cinereum.—Made by the refiners from the solution of copper obtained in precipitating silver from nitric acid by heating it in copper pans; this solution they heat, and pour upon whiting moistened with water; stirring the mixture every day till the liquor loses its colour, when it is poured off, and a fresh portion of the solution poured on, until the proper colour is obtained: an uncertain process, the colour sometimes turning out a dirty green, instead of a fine blue.

True Gold Powder. Aurum Pulveratum.—Grain gold one ounce, quicksilver nearly boiling six ounces; rub together; then either distil off the quicksilver, or corrode it away with spirit of nitre, and heat the black powder that is left red hot.

2. Grain gold one ounce; dissolve in a mixture of spirit of nitre sixteen ounces, with common salt four ounces; add to the clear solution green vitriol four ounces, dissolved in water; wash the precipitate and heat it red hot.

3. Dissolve gold in aqua regia, and draw off the acid by distillation; used in painting, gilding, &c.

Purple precipitate, Cassius' purple. Præcipitatum Cassii.—Solution of gold in aqua regia one ounce, distilled water one pound and a half; hang in the liquid slips of tin.

2. By precipitating the diluted solution of gold by dyers' spirit: used to communicate a purple colour to glass when melted in an open vessel; in a close vessel the glass receives no colour.

Tutenag.—Bismuth one pound, tin two pounds; melt together: used for buttons and vessels.

Zaffre. Saffra.—Is a mixture of one part of roasted cobalt, ground with two or three parts of very pure quartzose sand; is either in a cake, or reduced to powder; used as a blue colour for painting glass.

Smalt, Powder blue. Smalta, Azurum. Is made from roasted cobalt, melted with twice or thrice its weight of sand, and an equal weight of potash: the glass is poured out into cold water, ground to powder, washed over and sorted by its fineness, and the richness of its colour: used in painting and in getting up linen.

French Verdigris.—Blue vitriol twenty-four ounces, dissolved in a sufficient quantity of water; sugar of lead thirty ounces and a half, also dissolved in water; mix the solutions, filter, and crystallize by evaporation: yields about ten ounces of crystals; a superior paint to common verdigris, and certainly ought to be used in medicine, instead of the common.

Oxymuriat of Potash. Potassæ oxymurias.—Mix common salt three pounds, manganese two pounds, and add oil of vitriol two pounds, previously diluted with a sufficient quantity of water; distil into a receiver containing prepared kali six ounces, dissolved in water three pounds: when the distillation is finished, evaporate the liquid in the receiver slowly in the dark, the oxymuriat will crystallize first in flakes: stimulant, from one to two grains; explodes when struck, or dropped into acids.

Salt of Sorrel. Sal acetosellæ verus.—From the leaves of wood sorrel, bruised and expressed, the juice is then left to settle, poured off clear, and crystallized by slow evaporation: one hundred weight of wood sorrel yields five or six ounces.

2. By dropping aqua kali into a saturated solution of oxalic acid in water, when it precipitates, and may be separated by filtration: if too much alkali is added, it is taken up, and will require an addition of the acid to throw it down again: cooling; used to make lemonade and whey, as also salt of lemons.

Whiting.—Prepared from the soft variety of chalk, by diffusion in water, letting the water settle for two hours, that the impurities and coarser particles may subside, then drawing off the still milky water, letting it deposite the finer sediment, decanting the water when clear, and drying the sediment; is much finer than the common prepared chalk of the apothecaries, but is principally used as a cheap white paint.

Parker's cement.—Is made from the indurated marle called clay balls, or the waxen vein found in the London clay strata, by calcining and then grinding them, without any admixture whatever: used as a cement, and also for coating the outside of houses.

Ultramarine blue. Cœruleum ultramontanum.—Lapis lazuli one pound is heated to redness, quenched in water, and ground to a fine powder; to this is added yellow rosin six ounces; turpentine, bees' wax, linseed oil, of each two ounces; previously melted together, and the whole made into a mass; this is kneaded in successive portions of warm water, which it colours blue, and from whence it is deposited by standing, and sorted according to its qualities: a fine blue colour in oil.

Bleaching liquid, Eau de Javelle. Aqua alkalina oxymuriatica.—Common salt two pounds, manganese one pound, water two pounds, put into a retort, and add gradually oil of vitriol two pounds: pass the vapour through a solution of prepared kali four ounces in twenty-nine ounces water, applying heat towards the last. Specific gravity is 1.087. Stimulant, antisyphilitic; used to bleach linen and take out spots, and to clear books from what has been scribbled on their margins.

Tasteless ague Drop.—White arsenic one grain, water one ounce; dissolve: dose a tea-spoonful night and morning; used in the fen countries by private practitioners.

Italian poison. Aqua toffana.—White arsenic, prepared kali of each equal parts, aqua cymbalariæ q. p.; used by the Italians in secret poisoning, produces phthisis.

Bronzing liquor.—Is blue vitriol dissolved in water; used to bronze tea-urns, &c. the surface being previously well cleansed.

Artificial Spa water.—Prepared natron seven grains, magnesia alba one scruple, iron filings three grains, common salt one grain, water three pounds, and impregnate it with the gas from marble powder and oil of vitriol ana ten scruples, sufficiently diluted with water.

Artificial Pyrmont water.—Epsom salt fifteen grains, common salt five grains, magnesia alba ten grains; iron filings five grains, water three pounds, and impregnate it with the gas from marble powder and oil of vitriol ana seven drachms.

Artificial Seltzer water.—Common salt one drachm, magnesia alba one scruple, natron ppm. fifteen grains, chalk seven grains, water three pounds, and impregnate with the gas from marble powder and oil of vitriol ana six drachms.

Artificial Harrowgate water.—Common salt five drachms, water three pounds, and impregnate it with the gas from liver of sulphur and oil of vitriol ana four drachms.

Artificial Cheltenham water.—Epsom salt twelve grains, iron filings one grain, Glauber's salt four drachms, water four gallons, and impregnate with the gas from marble powder and oil of vitriol ana two ounces.

Wine test. Liquor probatorius vini.—Quicklime one ounce, orpiment half an ounce, distilled water half a pound: dissolve and filter.

2. Oyster shells, sulphur, ana one ounce, keep red hot for a quarter of an hour, when cold, add cream of tartar p. æq. water one pound, boil for an hour, decant into ounce phials and add to each spirit of salt twenty drops: a few drops of this liquor, added to any kind of wine, precipitate any metal that may be contained in it, except iron, which is prevented by the addition of the spirit of salt.

Young's purging drink.—Crystallized natron two and a half drachms, crystals of tartar three drachms, water eight ounces, corked up immediately in stone bottles and wired; a pleasant cooling laxative in summer.

Ward's White drops.—Quicksilver twelve ounces, spir. nitre two pounds; dissolve, add ammonia ppa. fourteen ounces, evaporate so as to form a light salt, which drain and dissolve in rose water three pounds and a half.

2. Quicksilver four ounces, spir. nitre one pound; dissolve, add ammonia ppa. seven ounces, evaporate and crystallize, then dissolve each pound of salt in three pints and a half of rose water.

Marking ink.—Lunar caustic two drachms, distilled water six ounces; dissolve and add gum water two drachms: dissolve also natron ppm. half an ounce in water four ounces, and add gum water half an ounce: wet the linen where you intend to write with this last solution, dry it, and then write upon it with the first liquor, using a clean pen.

Greek water.—Is prepared and used in the same manner, for turning the hair black.

Fly water.—White arsenic one drachm, water a pint; dissolve by boiling and sweeten with treacle; used to destroy flies.

Green sympathetic ink.—Saturate spirit of salt or aqua regia with zaffre or cobalt ore, free from iron, and dilute with distilled water; what is drawn upon paper with this liquor will appear green when it is warm, and lose its colour again when cold, unless it has been heated too much.

Blue sympathetic ink.—Dissolve cobalt or zaffre in spirit of nitre, precipitate by kali ppm. wash the precipitate, and dissolve it in distilled vinegar, avoiding an excess of the acid: to be used in the same manner as the last.

Dyers' spirit. Composition for scarlet dye.—Is a solution of tin in spirit of salt or aqua regia: the proper manner of making it is not determined, every workman having his own way. Spirit of nitre ten ounces, sal ammoniac one ounce, tin one ounce three-eighths is a good proportion for its preparation in a small way; used in dyeing scarlet, and in making many vegetable red colours.

Liquid rouge.—The liquid left in the preparation of carmine, v. p. 5.

Almond bloom.—Brazil dust one ounce, water three pints; boil, strain; add of isinglass six drachms, grana sylvestria two ounces, (or cochineal two drachms,) alum one ounce, borax three drachms; boil again and strain through a fine cloth: used as liquid cosmetics.

Pink dye.—Tie safflower in a bag and wash it in water till it no longer colours the water, then dry it; of this take two drachms, salt of tartar eighteen grains, spirit of wine seven drachms, digest for two hours, add two ounces of distilled water, digest for two hours more, and add a sufficient quantity of distilled vinegar or lemon juice, to reduce it to a fine rose colour: used as a cosmetic, and to make French rouge.

Saxon blue, Scot's liquid blue.—Indigo one pound, oil of vitriol four pounds; dissolve, by keeping the bottle in boiling water, then add twelve pounds of water, or q. p.

Wash colours for maps or writing. *Lacca fluida. Yellow.*—Gamboge, dissolved in water, a sufficient quantity.

French berries steeped in water, the liquor strained, and gum arabic added.

2. *Red.*—Brazil dust steeped in vinegar and alum added.

Litmus dissolved in water, and spirit of wine added.

Cochineal steeped in water, strained, and gum added.

3. *Blue.*—Saxon blue diluted with water q. p.

Litmus rendered blue by adding distilled vinegar to its solution.

4. *Green.*—Distilled verdigris dissolved in water, and gum added.

Sap green dissolved in water, and alum added.

Litmus rendered green by adding kali ppm. to its solution.

Nankeen dye.—Arnotto, prepared kali, of each equal parts, boiled in water: the proportion of kali is altered as the colour is required to be deeper or lighter; used to restore the colour of faded nankeen clothing.

Black ink. Atramentum.—Galls in sorts two pounds, logwood, green vitriol, of each one pound, water eight pounds, gum arabic q. p. very good.

2. Bruised galls one pound, green vitriol eight ounces, gum arabic four ounces, water two gallons, for common sale.

Refined ox gall. Fel bovis purificatum.—Fresh ox gall one pound; boil, skim, add one ounce of alum, and keep it on the fire for some time; to another pint add one ounce of common salt in the same manner; keep them bottled up for three months, then decant off the clear; mix them in an equal proportion; a thick yellow coagulum is immediately formed, leaving the refined gall clear and colourless: used by limners, enabling them to lay several successive coats of colours upon drawings, to fix chalk and pencil drawings so that they may be tinted, to remove the greasiness of ivory, and even allowing them to paint with water colours upon oiled paper or satin.

Colours for show bottles. *Yellow.*—Dissolve iron in spirit of salt and dilute.

2. *Red.*—Spirit of hartshorn q. p. dilute with water and tinge with cochineal.

Dissolve sal ammoniac in water and tinge with cochineal.

3. *Blue.*—Blue vitriol, alum, ana two ounces, water two pounds, spirit of vitriol a sufficient quantity.

Blue vitriol four ounces, water three pounds.

4. *Green.*—Rough verdigris three ounces; dissolve in spirit of vitriol, and add four pounds of water.

Add distilled verdigris and blue vitriol to a strong decoction of turmeric.

5. *Purple.*—Verdigris two drachms, spirit of hartshorn four ounces, water one pound and a half.

Sugar of lead one ounce, cochineal one scruple, water q. p.

Add a little spirit of hartshorn to an infusion of logwood.

Boot top liquid.—Sour milk three pounds, oil of vitriol two ounces, compound tincture of lavender three ounces, gum arabic one ounce, lemon juice two ounces, white of two eggs. M.

2. Sour milk three pounds, spirit of salt, spirit of vitriol ana two ounces, compound tincture of lavender one ounce. M.

3. Sour milk three pints, butter of antimony, cream of tartar ana two ounces, citric acid, burnt alum, common alum, ana one ounce.

Blacking.—Lamp black six pounds, sugar six pounds, dissolved in two pounds of water, sperm oil one pound, gum arabic three ounces, dissolved in two pounds of vinegar, vinegar three gallons, oil of vitriol one pound and a half. Mix s. a.

2. Ivory black, common treacle ana twelve ounces, sperm oil, oil of vitriol ana three ounces, vinegar 4 pints. Mix.

3. Ivory black, treacle ana two pounds, neats-foot oil eight ounces, oil of vitriol one ounce, gum tragacanth two ounces, vinegar six pints. Mix.

4. Ivory black six pounds, vinegar, water, ana two gallons, treacle eight pounds, oil of vitriol one pound.

5. Ivory black one ounce, small beer or water one pound, brown sugar, gum arabic, ana half an ounce, or, if required to be very shining, the white of an egg.

6. Ivory black four ounces, treacle eight ounces, vinegar, one pound: used to black leather.

Essence of anchovies.—Anchovies two to four pounds and a half, pulp through a fine hair sieve; boil the bones with seven ounces of common salt in six pounds of water; strain, add seven ounces of flour, and the pulp of the fish; boil, pass the whole through the sieve, colour with Venetian red to your fancy; it should produce one gallon.

Quin's sauce.—Soy eight pounds, walnut katchup, mushroom katchup, ana two gallons, anchovies eight pounds, Cayenne pepper eight ounces, garlic one pound.

2. Distilled vinegar one gallon, soy one pound, allspice eight ounces.

Soy.—Seeds of dolichos soja (peas or kidney beans may be used for them) one gallon, boil till soft, add one gallon of bruised wheat,

keep in a warm place for twenty-four hours, then add one gallon of common salt, two gallons of water; put the whole in a stone jar, bung it up for two or three months, shaking it very frequently, press out the liquor: the residuum may be treated afresh with water and salt, for soy of an inferior quality.

2. Seeds of beans thirty-five pounds, stew in a little water for two or three hours, till they can be bruised between the fingers; drain on a sieve, roll them while moist in flour of the same seeds, spread them upon strainers placed one upon another in a hamper, cover with a blanket for three or four days, or till the seeds are quite mouldy, then expose them to the sun or a fire until they are so hard that the mouldy crust may be rubbed off; now pour upon them one hundred pounds of water, and add twenty pounds of common salt; let the whole stand in a warm place for six weeks, pour off the now brown liquor, and evaporate gently to a proper consistence: some add spice.

Tomatoe sauce.—Love apples q. p. stew them in a little water and pulp them through a sieve, then add common salt an equal weight, and one-fourth of allspice whole; boil and bottle.

Katchup.—Mushrooms, common salt, ana four pounds, sprinkle the salt over them; when the juice is drawn out add eight ounces of pimento, and one ounce of cloves; boil for a short time, and press out the liquor: what remains may be treated again with salt and water for an inferior kind.

Walnut katchup.—Green shells of walnuts one bushel, common salt six pounds; let them remain for two or three days, stirring them occasionally that the air may turn them black, press out the liquor, add spices to the palate of the country, and boil it. Are all used for sauces.

Milk of roses.—Kali pp. six grains, ol. amygd. one ounce, ess. Bergam. two drachms, aquæ rosæ three ounces, aq. flor. aurant. two drachms. M.

2. Jordan almonds eight ounces, oil of almonds, Castile soap, white wax, ana half an ounce, spermaceti two drachms, ol. lavand. Angl. half a drachm, rose water three pounds, S. V. R. one pound. M.

3. Bitter almonds eight ounces, distilled water six ounces, elder-flower water four ounces, make an emulsion, and add ol. tart. p. deliq. three ounces, tinct. benz. two drachms. M. Used as a cosmetic wash.

Gowland's lotion.—Bitter almonds one ounce, sugar two ounces, distilled water two pounds; grind together, strain, and add corros. sublim. two scruples, previously ground with S. V. R. two drachms: used as a wash in obstinate eruptions.

Raisin wine—Raisins one hundred weight, water sixteen gallons; soak for a fortnight, stirring every day, press, put the liquor in a cask with the bung loose till it has done hissing, then add four pounds of brandy, and bung up close: some use little more than half, or two-thirds of this quantity of raisins.

Gooseberry wine.—Ripe berries bruised ten gallons, water thirty gallons, soak twenty-four hours, strain; to each gallon add two pounds of sugar, and ferment.

2. Bruised berries eighty pounds, water ten gallons, soak for a day, strain; to each gallon add six pounds of loaf sugar, and ferment.

3. Juice ten gallons, water twenty gallons, sugar seventy pounds; ferment.

4. Berries one hundred pounds, brown sugar six pounds, water a sufficient quantity to fill a fifteen gallon cask; yields a good yellowish white, very transparent wine.

5. Green berries forty pounds, water four gallons, bruise together, the next day press out the juice; to every gallon add three pounds of sugar: ferment.

Currant wine.—Red currants seventy pounds, bruised and pressed, brown sugar ten pounds, water a sufficient quantity to fill up a fifteen gallon cask; yields a pleasant red wine, rather tart, but keeping well.

2. White currants one sieve, red currants one gallon, press; to each gallon of juice add three gallons of water; to ten gallons of liquor add thirty pounds of sugar, and ferment; when you bung it up, add two pounds of brandy to each ten gallons of wine.

3. Juice eleven quarts, i. e. the produce of a sieve, sugar twenty pounds, water a sufficient quantity to fill up a nine gallon cask; ferment, and when it has done working, add four pounds of brandy: for a half hogshead use three sieves of currants, sugar three-fourths of a hundred weight, brandy one gallon.

Black currant wine.—Berries twenty pounds, brandy two to four pounds, water twelve to fourteen gallons, yeast two spoonsful, fermented for eight days, then bottled and well corked; yields a pleasant, rather vinous, cooling liquor of a purple colour; or they may be made into wine like the common currants: by the first process the wine is dark purple, rather thick but good.

Mixed fruit wine.—White currants three sieves, red gooseberries two sieves; these should yield forty pints of juice; to each gallon add two gallons of water, sugar three pounds and a half; ferment.

2. White, red, and black currants, cherries, especially black-heart, raspberries, ana p. æq. to each four pounds of the bruised fruit add one gallon of water, steep for three days, press, and to each gallon of liquor add three pounds of yellow sugar; ferment, and when finished add to each nine gallons two pints of brandy; if it does not fine soon enough, add half an ounce of isinglass, dissolved in a pint of water, to each nine gallons.

Cherry wine.—Cherries thirty pound, moist sugar five pounds, water a sufficient quantity to fill a seven gallon cask; ferment.

Parsnip wine.—May be made by cutting the root into thin slices, boiling them in water, pressing out the liquor, and fermenting it: this wine, when made strong, is of a rich and excellent quality and flavour.

Metheglin.—Honey one hundred weight, boiling water a sufficient quantity to fill a half hogshead or thirty-two gallon cask, stir it well for a day or two, add yeast, and ferment: some boil the honey in the water for an hour or two, but this hinders its due fermentation.

Mead.—Is made from the honey-combs, from which honey has been drained out, by boiling in water, and then fermenting; generally confounded with metheglin.

English Champaigne.—Raw sugar ten pounds, loaf sugar twelve pounds, water nine gallons, concrete acid of lemons or crystallized acid of tartar six drachms; dissolve by a gentle boil, before it grows cold, add about one pound of yeast, and ferment; when the working is nearly over, add perry one gallon, brandy three pounds, and bung it up for three months, then draw out two pounds of the wine, dissolve one ounce of isinglass in it, pour it again into the cask, and in a fortnight bottle it: it may be coloured pink by adding one ounce of cochineal when first bunged up.

English port.—Cider twenty-four gallons, juice of elder berries six gallons, port wine four gallons, brandy one gallon and a half, logwood one pound, isinglass twelve ounces, dissolved in a gallon of the cider: bung it down; in two months it will be fit to bottle, but should not be drank till the next year: if a rough flavour is required, four to six ounces of alum may be added.

Southampton port.—Cyder thirty-six gallons, elder wine eleven gallons, brandy five gallons, damson wine eleven gallons. M.

English Madeira.—Pale malt ground four bushels, boiling water forty-four gallons, infuse, strain, of this wort, while warm, take twenty-four gallons, sugar candy fourteen pounds; when dissolved, add two pounds of yeast; ferment, keep scumming off the yeast; when the fermentation is nearly finished, add two gallons and a half of raisin wine, brandy, port wine, ana two gallons, bung it down for six or nine months. A second infusion of the wort may be brewed for beer.

English sherry.—Loaf sugar thirty-two pounds, sugar candy ten pounds, water sixteen gallons, boil, add pale ale wort, (as for English Madeira) six gallons, yeast one pound: on the third day add ten pounds of stoned raisins, and in another two or three days one gallon of brandy; bung it down for four months, draw it off into another cask, add one gallon of brandy, and in three months bottle it. Imitations of foreign wines for those who wish to make a show above their circumstances, but far inferior to our own fruit wines.

Elder wine.—Juice of the berries eight gallons, water twelve gallons, brown sugar sixty pounds, dissolve by boiling, add yeast, and ferment, then add four pounds of brandy, and bung it up for three months: disagreeable when cold, but is mulled with allspice, and drank warm in winter time as a stimulant.

Ginger wine.—Bruised ginger twelve pounds, water ten gallons, boil for half an hour, add twenty-eight pounds sugar, boil till dissolved, then cool, and put the liquor along with fourteen lemons sliced, and three pounds of brandy, add a little yeast, and ferment; bung it up for three months, and then bottle it.

Orange wine.—Sugar twenty-three pounds, water ten gallons, boil, clarify with the white of six eggs, pour the boiling liquor upon the parings of one hundred oranges, add the strained juice of these oranges, and six ounces of yeast, let it work for three or four days, then strain it into a barrel, bung it up loosely; in a month add four pounds of brandy, and in three months it will be fit to drink.

Wines may also be made of blackberries and other English fruits upon the same principles. The above are the methods generally employed, but most persons have peculiar ways of proceeding, which may indeed be varied to infinity, and so as to produce at pleasure a sweet or dry wine; the sweet not being so thoroughly fermented as the dry. The addition of brandy destroys the proper flavour of the wine, and it is better to omit it entirely (except for elder or port wine, whose flavour is so strong that it cannot well be injured,) and to increase the strength by augmenting the quantity of the raisins or sugar. In general, the must for wines ought to be made of six pounds of raisins, or four pounds of sugar to the gallon, allowing for that contained in the fruit.

London Porter.—For five barrels: malt eight bushels, a sufficient quantity of water, mash at twice, add in the boiling, hops eight to twelve pounds, treacle six pounds, liquorice root eight pounds, moist sugar sixteen pounds, one half of which is usually made into essentia binæ, and the other half into colour, capsicum four drachms, Spanish liquorice two ounces, lintseed one ounce, cinnamon two drachms, heading two drachms; cool, add one to two gallons of yeast; when it has got a good head, cleanse it with three ounces of ginger, cocculus Indicus one ounce; then barrel and finish the working; fine with isinglass. The public brewers use a mixture of pale, amber, and brown malt, but amber alone is best for private families.

Six pounds of sugar is esteemed equal in strength, and one pound of coriander seed in intoxicating power, to a bushel of malt: the sugar employed is burnt to colour the beer instead of brown malt, and it has been proposed to employ roasted coffee for this purpose; the other substances are merely to flavour the liquor, and may be varied at pleasure.

The desire of evading the duty on malt has occasioned the discovery of its being necessary to malt only one third of the corn, as this portion will convert the other into its own nature during the process.

Ginger Beer.—Three pounds of lump sugar, two ounces bruised ginger, one ounce cream of tartar, lemons sliced no 4, pour on them four gallons of boiling water, add eight ounces of yeast, work for four days, then bottle in half pints, and tie the corks down.

2. Six pounds of moist sugar, five ounces of ginger, two ounces cream of tartar, lemons no 4, eight ounces of yeast, seven gallons of water, work two or three days, strain, add one pound of brandy, bung very close, and in fourteen days bottle it: a cooling effervescent drink in summer.

White Spruce Beer.—To ten gallons of water, put six pounds of sugar, four ounces of essence of spruce, add yeast, work as in making ginger beer, and bottle immediately in half pints.

Brown Spruce Beer.—As the white, using treacle in lieu of sugar.

The purer kinds of the above liquors are mixtures of spirit of wine, water, and extractive matter; the spirit many be separated by careful distillation, or, if the extractive matter be first got rid of by the addition of extractum Saturni and filtration, the spirit may be separated by adding very pure and dry kali ppm. when it will swim upon the liquor: the spirit constitutes from twelve to twenty-five per cent. of the proper wines, and from two to eight per cent. of the malt liquors.

The fermentation of these liquors is usually hastened by the addition of yeast, crude tartar or bruised vine leaves, but this is seldom necessary for wines if the liquor be kept in a proper warmth, but malt liquors are more sluggish.

If the fermentation is in danger of proceeding too far, it may be stopped by drawing off the liquor clear into another vessel, in which some brimstone has been newly burned, or in the case of red wine, some nutmeg powder upon a hot shovel, or which has been washed with brandy; the sediment left in the old cask may be strained through flannel or paper till clear, and added to the other: instead of this a part only may be drawn out of the cask, and some rags dipped in melted brimstone and lighted may be held by a pair of tongs in the bung-hole, slightly covered, so as to impregnate the liquor with the fumes, about one ounce of brimstone to a hogshead, then returning what had been drawn out, and bunging up very close; or a small quantity of oil of vitriol may be poured in: lastly, the addition of black manganese has been proposed on theoretical grounds.

If the fermentation has already proceeded too far, and the liquor become sour, the further fermentation must be stopped as above, and some lumps of chalk, or burned oyster shells added to saturate the acid already generated.

If the liquors do not become clear soon enough, for each thirty-six gallons, dissolve one ounce of isinglass in two pounds of water, strain and mix this with part of the liquor; beat it up to a froth and pour it into the rest of the liquor, stir the whole well and bung it up: instead of isinglass some use hartshorn shavings in rather larger quantity: red wines are fined with twelve eggs to the pipe, beaten up to a froth, mixed with the wine and well stirred in.

If the liquor has acquired a bad flavour, the best way is to let the fermentation go on, and convert it at once into vinegar.

Eau de Luce veritable.—Kali pp. three drachms, oleum succini fœtidum a drachm and a half; rub together, and add by degrees S. V. R. four ounces, digest fifteen minutes, decant: a few drops of this liquor, poured into aq. ammon. puræ, forms eau de luce of the true milky cloudy appearance, and not settling.

2. S. V. R. four ounces, ol. succ. fœt. one drachm; dissolve, decant, and pour into aq. ammon. puræ two pounds, or rather more.

Antispasmodic; used in hysteric fits, and bites of venomous serpents, one drachm in water or wine.

Eau de Cologne.—Essence de Bergam. three ounces, essence of neroli one drachm and a half, essence de cedrat two drachms, essence limonum three drachms, ol. rorismar. one drachm, S. V. R. twelve pounds, spir. rorism. three pounds and a half, aq. meliss. compos. two pounds and four ounces, mix: distil in B. M. and keep it in a cold cellar or ice-house for some time; used externally as a cosmetic, and made with sugar into a ratafia.

Smith's British Lavender.—Ol. lavand. Angl. two ounces, essence amber gr. one ounce, eau de luce one pint, S. V. R. two pints.

Essence of Peppermint.—S. V. R. one pint, put into it kali pp. one ounce, previously heated, decant, and add ol. menth. pip. half an ounce. M.

2. Ol. menth. pip. one pound, S. V. R. two gallons, colour with herb. menth. pip. sicc. eight ounces. M.

3. Ol. menth. pip. three ounces, S. V. R. coloured with spinage two pints. M.

Hill's Balsam of Honey.—Bals. Tolu one pound, honey one pound, S. V. R. one gallon.

2. Bals. Tolu opt. two ounces, gum. styrac. two drachms, opii pur. half a drachm, mell. opt. eight ounces, S. V. R. two pints: pectoral, used in coughs and colds.

Ford's Balsam of Horehound.—Horehound, liquorice root, ana three pounds eight ounces, water a sufficient quantity to strain six pints; infuse, to the infusion add proof spirit or brandy twelve pints, camphire one ounce and two drachms, opium pur. benjamin ana one ounce, dried squills two ounces, oil of anise seed one ounce, honey three pounds and eight ounces.

Eau de Husson.—Is probably a mixed tincture or wine of henbane and colchicum: a tincture of colchicum has been proposed for it by Want; a tincture of hedge hyssop is said to be sold for it by Reece; and a wine of white hellebore proposed by More, but neither of them is possessed of the same characters as the Parisian medicine.

Peppermint Cordial.—Ol. menth. pip. seventy-five drops, sugar one ounce; grind together, add S. V. R. one pint, dilute with S. V. R. ten pints, water ten gallons, and fine with alum three drachms; stimulant.

Bateman's Pectoral Drops.—Sem. fœnic. dulc. two pounds and eight ounces, sem. anisi one pound, proof spirit four gallons, water a sufficient quantity; distil ten gallons, to which add opium seven ounces and four drachms, camphor six ounces, kali pp. one ounce, coral. rubr. four ounces.

2. Castor N. A. two ounces, opium, ol. anisi ana one ounce and four drachms, camph. eight ounces, sem. fœnic. dulc. two ounces, tinct. antim. four ounces, proof spirit ten pints, add rad. valerian and cochineal in powder.

3. Castor, camph. ana four ounces, coccin. one ounce, S. V. R. two gallons, water one gallon.

4. Opii, camph. ana one pound, castor, ol. anisi, santal. rubr. ana four ounces, treacle ten pounds, S. V. R. five gallons, water four gallons.

5. Opii, camph. ana ten drachms, coccin. one drachm, kali ppt. four scruples, ol. fœnic. dulc. one drachm (or seeds three ounces), proof spirit fourteen pints, water two pints: produces fifteen pints.

6. Castor one ounce, ol. anisi one drachm, camph. five drachms, coccin. one drachm and a half, opii six drachms, proof spirit one gallon.

Daffy's Elixir. Elixir Salutis.—Fol. senn. four ounces, ras. lign. Sanct., rad. enulæ sicc., sem. anisi, sem. carui, sem. coriand., rad. glycyrr. ana two ounces, raisins (stoned) eight ounces, proof spirit, six pounds. This is now sold by the name of *Dicey's Daffy*.

2. *Tinct. Sennæ, T. Sennæ* P. L.—Fol. sennæ one pound, sem. carui one ounce and a half, sem. card. min. half an ounce, raisins sixteen ounces, proof spirit one gallon.

3. *T. Sennæ* P. D.—The same, but omitting the raisins.

4. *T. Sennæ Composita.*—Fol. senn. two ounces, rad. jalap. one ounce, sem. coriand. half an ounce, proof spirit three pounds and a half by weight, when made, add white sugar four ounces.

5. Fol. senn., rad. rhei, sem. anisi ana two pounds, rad. jalap., sem. carui ana one pound, sant. rubr. eight ounces, proof spirit ten gallons, brown sugar four pounds.

6. Rhubarb. E. Ind. forty pounds, sennæ fifteen pounds, sant. rubr. five pounds, sem. carui, sem. anisi, sem. coriandri ana five pounds, cineres Russici eight ounces, S. V. R. ten gallons; digest three days, then add proof spirit eighty gallons, treacle forty-six pounds.

7. Rad. rhei fourteen pounds, sem. anisi ten pounds, sennæ parvæ eight pounds, rad. jalap. four pounds, sant. rubr. three pounds and eight ounces, ciner. Russ. two pounds, S. V. R. thirty-eight gallons, water eighteen gallons.

8. *Swinton's Daffy.*—Rad. jalap. three pounds, fol. sennæ twelve ounces, sem. coriand., sem. anisi, rad. glycyrrh., rad. enulæ ana four ounces, S. V. R., water ana one gallon.

9. Rad. enulæ, ras. guaiaci, sem. coriand., rad. rhei, rad. glycyrr., sem. anisi ana three ounces, raisins one pound and eight ounces, proof spirit ten pints.

10. Rad. jalap. three pounds, fol. sennæ one pound, sem. anisi six ounces, sem. coriand. four ounces, cort. aurant. sicc. two ounces, proof spirit two gallons.

11. Fol. sennæ seven pounds, rad. jalap. five pounds, sem. anisi fourteen pounds, sem. carui four pounds, sem. fœnic. dulc. four pounds, brandy colouring two gallons, S. V. R. twenty-six gallons, water twenty-four gallons; let it stand three weeks, strain, washing out the last portions with water two gallons, then add treacle twenty-eight pounds. A common remedy in flatulent colic, and used as a purge by those accustomed to spirit drinking: dose one, two or three table spoonsful.

Steer's Opodeldoc.—Sap. Cast. three pounds, S. V. R. three gallons,

camph. fourteen ounces, ol. rorism. three ounces, ol. origani six ounces, aq. ammon. pur. two pounds.

2. Sap. alb. one pound, camph. two ounces, ol. rorism. four drachms, S. V. R. two pints.

3. Sap. alb. one pound, camph. four ounces, ol. origan., ol. rorism. ana four drachms, S. V. R. q. v. it will bear near six pints.

4. Sap. alb. three pounds, camph., ol. rorism. ana six ounces, spir. am. comp. fourteen ounces, S. V. R. four gallons and a half.

5. Sap. alb. four ounces, camph. one ounce, ol. rorism. two drachms, ol. origani thirty drops, S. V. R. one pint, water half a pint.

Shaving Liquid, Shaving Oil.—Sap. moll. four pounds, S. V. R. five pints.

2. *Essence royale pour faire la barbe.*—Sap. Cast. eight ounces, proof spirit one pint.

Squire's Elixir.—Opium four ounces, camphor. one ounce, coccinel. one ounce, ol. fœniculi dulc. two drachms, tinct. serpent. one pint, spir. anisi two gallons, water two pints, and add aur. musiv. six ounces.

2. Rad. glycyrrh. one pound, kali pp. four ounces, coccinel. one ounce, water twelve pints; boil till reduced to one gallon, then add tinct. opii twelve ounces, camphor. one ounce, S. V. R. four pints, aur. musiv. twelve ounces.

3. Opii one ounce and four drachms, camph. one ounce, coccin., kali pp. ana one drachm, burnt sugar two ounces, tinct. serpent. one pint, sp. anisi two gallons, aur. musiv. eight ounces.

Stoughton's Elixir.—Rad. gent. two pounds and four ounces, rad. serpent. Virg. one pound, cort. aurant. sicc. one pound and eight ounces, cal. aromat. four ounces, S. V. R., water ana six gallons.

2. Rad. gent. four pounds, cort. aurant. two pounds, pis. aurant. one pound, coccin. two drachms, sem. card̃m. min. one ounce, S. V. R. eight gallons.

Eaton's Styptic. Tinctura Styptica.—Green vitriol calcined one drachm, proof spirit, tinged yellow with a little oak bark, two pounds.

2. Galls, crocus Martis ana four ounces, proof spirit one gallon.

Greenough's Tincture for the teeth.—Amygd. amar. two ounces, lign. Bras., bacc. cass. ana four drachms, ireos Florent. two drachms, coccin., sal. acetosel. ver., alumin. ana one drachm, S. V. R. two pints, spir. cochlear. four drachms.

Ruspini's Tincture for the teeth.—Rad. ireos Flor. eight ounces, caryoph. arom. one ounce, S. V. R. two pints, ess. ambr. gris. one ounce.

Friar's Balsam, Vervain's Balsam, Wade's Drops, Jesuit's Drops, the Commander's Balsam, Wound Balsam, Balsam for cuts, &c. Balsamum Traumaticum, Tinctura Benzoes Composita, Tinctura Benzoini Composita.—Benz. three ounces, stor. colati two ounces, bals. Tolu one ounce, aloes Socotr. half an ounce, S. V. R. two pounds.

2. *T. Benzoin Composita.*—Benz. three ounces, bals. Peru. two ounces, al. hepat. half an ounce, S. V. R. two pounds by weight.

3. Benz. seventeen pounds, stor. col. twelve ounces, bals. Tolu eight ounces, gum. guaiaci one pound, aloes Cap. olibani, tereb. Venet. ana eight ounces, pulv. curcum. one ounce, S. V. R. two gallons water four gallons.

4. Benz. three ounces, al. Socotr. half an ounce, S. V. R. thirty-two ounces; digest for two days, then add bals. Peru. two ounces.

5. Benz. eight ounces, gum. stor., gum. guaiaci (parv.) ana six ounces, bals. Tolu, aloes ana two ounces, bals. Peru. one ounce, S. V. R. one gallon.

Common Varnish.—Sandarac eight ounces, tereb. Venet. six ounces, S. V. R. two pints.

Transparent Varnish.—Gum. Juniper eight ounces, tereb. Venet. four ounces, mastic two ounces, S. V. R. two pints: used upon wood.

White Varnish.—Gum. junip. one pound, Strasburgh turpentine six ounces, S. V. R. two pints: used upon paper, wood, and linen.

White hard Varnish.—Mastich four ounces, gum. juniper., ter. Venet. ana three ounces, pounded glass (to prevent the gums from forming an impenetrable mass) four ounces, S. V. R. two pints: used upon cards, sheaths.

White Polishing Varnish.—Mastich in tears two ounces, gum. juniper. eight ounces, gum. elemi one ounce, tereb. Argent. four ounces S. V. R. two pints: used upon metal, polished with pumice powder.

Transparent Copal Varnish.—Spirit of wine, fully charged with camphor, four ounces, copal in fine powder one ounce: dissolve, filter, add the filtered liquor to S. V. R. one pint, in which gum. elemi one ounce has been previously dissolved.

2. S. V. R. one pint, camphire half an ounce: dissolve, pour it upon copal in small pieces four ounces; heat it so that the bubbles that rise up may be counted, when cold, pour it off, and add more spirit to the residuum: used for pictures.

3. Copal, melted and poured into water three ounces, gum. sandarac. six ounces, mastich three ounces, tereb. Argent. two ounces and an half, pounded glass four ounces. S. V. R. two pints: used for metals, chairs, &c.

Soft brilliant Varnish.—Gum. sandarac. six ounces, gum. elemi four ounces, gum. anime one ounce, camphor four drachms, S. V. R. two pints: used upon wood works, pasteboard.

Reddish Varnish.—Gum. sandarac. eight ounces, lacca in tabulis two ounces, resina nigr. four ounces, tereb. Venet. six ounces, S. V. R. two pints: used upon wood and metals.

Lacquer.—Seed lac, dragon's blood, arnotto, gamboge ana four ounces, saffron one ounce, S. V. R. ten pints.

2. Turmeric one pound, arnotto two ounces, shell lac, gum juniper ana twelve ounces, S. V. R. twelve ounces.

3. Seed lac three ounces, amber, gamboge ana two ounces, watery extract of red sanders half a drachm, dragon's blood one drachm, saffron half a drachm, S. V. R. two pints four ounces.

4. Turmeric six drachms, saffron fifteen grains, S. V. R. one pint four ounces: draw the tincture, add gamboge six drachms, gum. sandarac, gum. elemi ana two ounces, dragon's blood, seed lac ana one ounce: used upon metals and wood to give a golden colour.

Red Varnish.—Sandarac four ounces, seed lac two ounces, mastich, choice benjamin ana one ounce, turpentine two ounces, S. V. R. two pints: used for violins and cabinet work.

Syrop of Maidenhair, Sirop de Capillaire. Syrupus capillorum Veneris, Capill. Veneris five ounces, rad. glycyrrh. two ounces, boiling water six pounds; steep for six hours, strain, add white sugar three pounds.

2. *Syr. Pectoralis.*—Fol. trichomanis sicc. five ounces, rad. glycyrrh. four ounces, boiling water five pounds, sugar a sufficient quantity.

3. White sugar twenty-four pounds, water sixteen pints, boil nearly to a syrop, clarify with white of three eggs, scum, and finish the boiling, adding, while warm, aq. naphæ one pint.

4. Gum. tragacanth. three ounces, water two gallons; boil, strain, and make it up three gallons; add white sugar twenty-four pounds, clarify with the white of five eggs, and then add aq. flor. aurant. two pints and a half.

5. Capill. Veneris one ounce, water six pints; steep, strain, add white sugar eight pounds, boil to a syrop, adding, when cold, aq. flor. aurant. two ounces.

6. Lump sugar eight pounds, water one gallon; boil, scum, and clarify with the white of an egg, when nearly cold add rose water one pint, put it up in very dry warm bottles; it may be coloured with brandy colouring if desired: nutritive, restorative, an elegant addition to pump water in summer time.

Syrop of Lemon Juice. Syrupus e succo limonum, Syr. succi limonis, Syr. limonis.—Juice, rendered clear by settling and subsequent filtering one pint, white sugar two pounds.

2. *Syr. citri Medicæ.*—Juice rendered clear as before, three pounds, sugar five pounds: cooling, expectorant, pleasanter than oxymel.

Sirop d'Orgeat. Syrupus amygdalinus, Syr. hordeatus.—Amygd. dulc. one pound, amygd. amar. two drachms; make an emulsion by adding decoct. hord. two pounds; strain, to the strained liquor ten ounces, add sacch. alb. one pound and a half, and when the sugar is dissolved, aq. flor. aurant. one drachm.

2. New almonds eight ounces, bitter almonds four ounces, rub with a little water into an emulsion, strain, rub what is left upon the strainer afresh, with the emulsion, to made it as rich as possible, add white sugar three pounds, orange flower water two ounces, spirit of lemon peel six drachms; strain through flannel, and put up into bottles: cooling, demulcent.

Stoughton's Elixir.—Rad. gent. two pounds four ounces, rad. serpent. Virg. one pound, cort. aurant. sicc. one pound eight ounces, cal. aromat. four ounces, S. V. R., water ana six gallons.

2. Rad. gent. four pounds, cort. aurant. two pounds, pis. aurant.

one pound, coccin. two drachms, sem. cardam. min. one ounce, S. V. R. eight gallons.

Syrop of Black Currants. Syrupus e ribis nigris. As syrop of lemon juice: cooling.

Ratafia des cerises.—Morello cherries with their kernels bruised eight pounds, proof spirit eight pints; digest for a month, strain with expression, add sugar one pound eight ounces.

Ratafia de Grenoble.—Small wild black cherries with their kernels bruised twelve pounds, proof spirit six gallons: digest for a month, strain, add sugar twelve pounds, a little citron peel may be added at pleasure.

Ratafia de noyaux.—Peach or apricock kernels, with their shells, bruised, no. 120, proof spirit four pints, sugar ten ounces: some reduce S. V. R. to proof, with the juice of apricocks or peaches, to make this liqueur.

Escubac. Usquebaug.—Saffron one ounce, juniper berries four drachms, dates without their kernels, raisins ana three ounces, jujebs six ounces, anise seed, mace, cloves, coriander seed ana one drachm, cinnam. two drachms, proof spirit twelve pints, simple syrop six pounds: pectoral, emmenagogue.

Chrème des Barbades.—Orange peels, lemon peels ana no. 3, cinnamon four ounces, mace two drachms, cloves one drachm, rum eighteen pints: distil in B. M. and add sugar p. æq.

Chrème des Barbades. English.—Lemons sliced no. 24, citrons sliced no. 6, S. V. R. two gallons four pints, fresh baulm leaves eight ounces, water three gallons four pints: digest for a fortnight, strain.

Cedrat.—Lemon peels no. 12, S. V. R. two gallons: distil in B. M. and add simple syrop p. æq.

Parfait amour.—The same, coloured with a little cochineal.

Brandy Shrub.—Brandy nine pints, lemon juice, orange juice ana one pint, orange peels no. 4, lemon peels no. 2, sugar two pounds, water 5 pints.

Rum Shrub.—The same, using rum instead of brandy.

2. Concrete acid of lemons eight ounces, water five gallons, raisin wine four gallons, rum ten gallons, orange flower water four pints, honey six pounds.

Chrème de Noyaux. English.—Bitter almonds blanched four ounces, proof spirit two pints, sugar one pound.

Chrème d'Orange. English.—Oranges sliced no. 36, S. V. R. two gallons, sugar eighteen pounds, water four gallons four pints, tincture of saffron one ounce four drachms, orange flower water four pints: digest for a fortnight, strain.

All the above liqueurs are stimulant, and taken ad libitum for pleasure.

Godfrey's cordial.—Venice treacle, ginger ana two ounces, S. V. R. three pints, ol sassafr. six drachms, water three gallons, treacle fourteen pounds, tinct. Theb. four pints.

2. Sassafras one pound, ginger four ounces, water three gallons;

boil gently to two gallons, add treacle sixteen pounds, S. V. R. seven pts. tinct. Theb. one pint.

3. Opium eight ounces, ol. carui, ol. sassafr. ana five ounces, treacle fifty-six pounds, S. V. R. one gallon, water eight gallons.

4. Opium four drachms, treacle four pounds, boiling water one gallon: dissolve, add S. V. R. two ounces, ol. sassafr. gtt. xl.

5. Opium one ounce and a half, treacle seven pounds, S. V. R. two pints, ol. sassafr. two drachms, extr. jalapæ four drachms, water two gallons; produces twenty-one pints.

6 Sem. carui, sem. coriandri, sem. anisi ana four pounds, water a sufficient quantity: distil sixteen gallons, to which add opium twelve ounces, ol. sassafr. four ounces, dissolved in S. V. R. two gallons, proof spirit five gallons, treacle eighty-four pounds.

7. S. V. R. one pint, tinct. opii two ounces, ol. sassafr. one ounce and a half, water ten pounds, treacle seven pounds.

8. Sassafras two pounds, boil in water one gallon to seven pints; strain, add brown sugar seven pounds, opium two ounces previously dissolved in a pint of water, and S. V. R. one pound. Anodyne, narcotic; chiefly used to prevent the crying of children.

Dalby's carminative.—Tinct. opii four and an half drachms, tinct. ass. fœt. two and an half drachms, ol. carui three scruples, ol. menth. pip. six scruples, tinct. castor. six and an half drachms, S. V. R. six drachms; put two drachms into each bottle with magnesia one drachm, and fill up with simple syrop and a little S. V. R.

Scotch marmelade.—Juice of Seville oranges two pints, yellow honey two pounds; boil to a proper consistence.

Almond paste.—Almonds blanched four ounces, lemon juice two ounces, oil of almonds three ounces, water one ounce, proof spirit six ounces.

2. Bitter almonds blanched one pound, white of four eggs, rose water, S. V. R. ana a sufficient qnantity.

Brown almond paste.—Bitter almonds blanched, pulp of raisins, ana one pound, proof spirit a sufficient quantity: cosmetic, softens the skin and prevents chaps.

Almond paste. Pasta regia, P. amygdalina—Amygd. dulc. decort. one pound, amygd. amar. decort. half an ounce, sugar one pound, aq. flor. aurant. a sufficient quantity; beat to a paste, sufficiently stiff not to stick to the fingers.

Ready made mustard.—Flour of black mustard seed, well sifted from the bran, three pounds, salt one pound; make it up with currant wine, and add three or four spoonsful of sugar to each pint.

Blacking paste.—Rape oil three ounces, oil of vitriol three ounces; mix: the next day add treacle, ivory black, ana three pounds, stone blue six ounces, vinegar a sufficient quantity to form a stiff paste: this will fill one dozen tin boxes.

2. Rape oil three ounces, treacle, brown sugar, ana nine ounces; mix, add ivory black three pounds, flour paste two pounds; when the paste is quite smooth, thin it to the consistence of honey, with a sufficient quantity of vinegar: used for making blacking for leather.

James's analeptic pills.—Pil. Rufi. one pound, calc. antimonii lotæ eight ounces, gum. guaiaci eight ounces: M. and make thirty-two pills from each drachm.

2. Pil. Rufi, pulv. antimonialis, gum. guaiaci, ana one scruple: make into twenty pills.

Anderson's Scots pills.—Aloes Bbds. one pound, rad. helleb. nigr., rad. jalapii, kali ppi. ana one ounce, ol. anisi. four drachms, syr. simp. a sufficient quantity.

2. Aloes B. B. two pounds eight ounces, water eight ounces; soften, add jalap., sem. anisi. pulv., ebor. usti ana eight ounces, ol. anisi one ounce.

3. Aloes (Bermudas) one pound, rad. jalap., flor. sulph., ebor. usti, rad. glycyrrh. ana two ounces, ol. anisi one drachm, gamboge two drachms, sap. Castil. four ounces, syr. sp. cervin. a sufficient quantity.

Hooper's pills.—Vitriol. virid., aquæ ana eight ounces: dissolve, add aloes Barb. two pounds eight ounces, canellæ albæ six ounces, gum. myrrh. two ounces, opoponacis four drachms.

2. Sal Martis two ounces, pulv. aloes c. canella one pound, mucilag. gum. tragacanthæ, tinct. aloes, ana q. s.; cut each drachm into eighteen pills, put forty in a box.

Matthew's pills, Starkey's pills.—Rad. helleb. nigri, rad. helleb. albi, rad. glycyrrh., opii ana two ounces, sapon. Starkeii six ounces, ol. terebinth a sufficient quantity.

2. Rad. helleb. nigri, rad. glycyrrh., sapon. Castill., rad. curcumæ, opii purif., syr. croci, ana four ounces, ol. terebinth. a sufficient quantity.

Ward's Antimonial pill.—Glass of antimony, finely levigated, four ounces, dragon's blood one ounce, mountain wine a sufficient quantity: make into pills of one and a half grains each.

Barclay's antibilious pills.—Extr. colocynth. two drachms, resin. jalap. one drachm, sapon. amygdal. one drachm and a half, guaiaci three drachms, tart. emetic. eight grains, ol. junip., ol. carui., ol. rorismar. ana four gtt. syr. spin. cerv. a sufficient quantity: make into sixty-four pills.

Worm pills.—Calomel one ounce, sugar two ounces, starch one ounce, mucil. gum tragac. a sufficient quantity, to make two hundred and forty-eight pills: dose no. 1, night and morning, for children.

Keyser's pills.—Hydrarg. acetat. four ounces, mannæ thirty ounces, starch two ounces, mucil. gum. tragac. a sufficient quantity, make into pills of six grains each: dose no. 2, nocte maneque, increasing the dose to no. 25, or more: a box of 1000 or 1200 pills is usually sufficient.

Refined juice, refined liquorice.—Spanish liquorice four pounds, gum arab. two pounds, water a sufficient quantity: dissolve, strain, evaporate gently to a soft extract, roll into cylinders, cut into lengths, and polish by rubbing them together in a box: expectorant, in coughs, &c.

Pate de réglisse noire.—Refined liquorice eight ounces, gum arabic two pounds, sugar one pound, water a sufficient quantity: dis-

solve, and evaporate till it forms a very thick syrup, add rad. enulæ camp., rad. irid. Flor. ana half an ounce, ess. de cedrat a few drops, put into tin moulds, and dry in a stove.

Worm cakes.—Scamm. Alepp. two ounces, calomel ppd. three ounces, res. jalapii two ounces, crem. tartari four ounces, white sugar three pounds, mucil. g. trag. a sufficient quantity.

2. *Storey's worm cakes.*—Calomel, jalap. ana one drachm, ginger two scruples, sacch. one ounce, cinnabar antim. a sufficient quantity to colour them, syr. simp. a sufficient quantity to make into cakes.

3. *Ching's yellow worm lozenges*—Saffron four drachms, water one pint; boil, strain, add one pound of calomel, white sugar twenty-eight pounds, muc. g. trag. a sufficient quantity: each lozenge should contain one grain of calomel.

4. *Ching's brown worm lozenges.*—Calomel seven ounces, extr. jalapii resinos. three pounds eight ounces, white sugar nine pounds, muc. g. trag. a sufficient quantity: each lozenge should contain half a grain of calomel.

5. Calomel one ounce, res. jalap. two ounces, white sugar two pounds, muc. g. tragac. made with rose water, a sufficient quantity: make 2520 lozenges, weighing eight grains, and containing one-fourth of a grain of calomel, and half a grain of res. jalap. each.

Cephalic snuff. Pulvis cephalicus.—Fol. asari, fol. majoran., fol. lil. convall. ana p. æq.

2. *P. asari comp. P. D.*—Fol. sicc. asari one ounce, flor. lavand. two drachms.

Earl of Warwick's powder. Pulvis comitis Warwicensis.—Scammonii two ounces, antimonii diaph. one ounce, crem. tartari half an ounce.

Indian ink. Indicum, atramentum Indicum.—The best kind is made of real lamp black, procured by burning oil under shades, mixed up with glue made of an ass's skin, to which is added a little musk: astringent, one to two drachms, dissolved in water or wine, in hemorrhage; also stomachic.

2. The common sort is common lamp black from the fir, made up with glue.

3. Horse beans burnt perfectly black, ground fine, and made up into sticks with gum water: is very inferior to the others.

4. Honey one pound, yelk of eggs no. 2, gum arab. half an ounce, lamp black a sufficient quantity: beat into a mass.

Lump archel. Lacmus tinctorius.—Prepared from Canary archel, ground archel, and some other lichens, by reducing them to powder, adding half as much pearl ashes, and moistening the whole with urine or common spirit of hartshorn; a small proportion of lime is then added, and the archel cut into cubes and dried.

Litmus. Lacmus tinctorinus albo-cœruleus.—Prepared like the former, adding a large proportion of whiting at the end, which renders it of a light blue colour.

Cudbear.—Another preparation of the lichens, made in a similar manner. All are used in dyeing violet colours, which, however, do

not stand well; also employed by the chemists as very delicate tests for acids, the infusion or tincture being reddened by them.

Florence lake. Lacca Florentina.—Pearl ashes one ounce four drachms, water a sufficient quantity, dissolve; alum. Rom. two ounces four drachms, water a sufficient quantity, dissolve: filter both solutions, and add the first to the alum solution while warm, strain, mix the sediment upon the strainer with the first coarse residuum obtained in boiling cochineal with alum for making carmine, and dry it.

Common lake. Lacca in globulis.—Make a magistery of alum, as in making Florence lake; boil one ounce four drachms Brazil dust in three pints of water; strain, add the magistery or sediment of alum to the strained liquor, stir it well, let it settle, and dry the sediment in small lumps.

Fine madder lake. Lacca columbina.—Dutch grappe madder (that is, madder root ground between two mill-stones a small distance apart, as in grinding pearl or French barley, so that only the bark, which contains the most colour, is reduced to powder, and the central woody part of the root left) two ounces; tie it up in a cloth, beat it in a pint of water in a stone mortar, repeat it with fresh water, in general five pints will take out all the colour, boil, add one ounce of alum, dissolved in a pint of water, then add one ounce and a half of oil of tartar, wash the sediment, and dry; produces half an ounce.

Rose pink.—Whiting coloured with a decoction of Brazil wood and alum.

Dutch pink.—Whiting coloured by a decoction of birch leaves, dyer's weed, or French berries, with alum.

Stone blue. Indicum vulgare.—Starch coloured with indigo.

Crayons.—Spermaceti three ounces, boiling water one pint, add bone ashes finely ground one pound, colouring matter as oker, &c. q. p. roll out the paste, and when half dry cut it in pipes.

2. Pipe clay, coloured with oker, &c. q. p. make it a paste with ale wort.

Ink powder.—Green vitriol one pound, galls two pounds, gum arab. eight ounces: two ounces make a pint of ink.

Tooth Powder. Pulvis dentifricus.—Rad. irid. Flor. four ounces, oss. sepiæ two ounces, crem. tart. one ounce, ol. caryoph. sixteen drops, lake 16 drops.

2. Catechu one ounce, cort. Peruv. flav., crem. tart., cassiæ, bol. Armen. ana four drachms, sang. dracon., myrrhæ ana two drachms.

3. Rose pink twenty ounces, bol. Armen., oss. sepiæ, crem. tart. ana eight ounces, myrrh. four ounces, rad. irid. Flor. two ounces, ess. Bergam. half a drachm.

4. Oss. sepiæ four ounces, crem. tart., rad. irid. Flor. ana two ounces, alum. usti, rose pink ana one ounce.

5. Magnesiæ, rad. irid. Flor., rose pink, cretæ ppæ. ana two ounces, natr. ppi. six drachms, ol. rhodii two drops.

Silvering powder.—Silver dust from fifteen to twenty grains, cream of tartar, common salt ana two drachms, alum half a drachm.

2. Silver dust half an ounce, common salt, sal ammoniac ana two ounces, corros. sublimate one drachm; make into a paste with water: used to silver copper, which is to be cleaned by boiling with argol and alum, then rub it with either of these powders, and polish with soft leather.

Currie powder.—Sem. coriandri thirteen ounces, pip. nigri two ounces, pip. Cayenne one ounce, rad. curcumæ, sem. cumini ana three ounces, sem. fœnugr. four drachms.

2. Zz., pimentæ, rad. curcumæ ana one pound, caryoph. arom. one ounce, pip. Cayenne, sem. coriandri ana eight ounces.

3. Sem. coriandri thirteen ounces, pip. nigri five ounces, pip. Cayenne one ounce, sem fœnugr., sem. cymini ana three ounces, rad. curcumæ six ounces.

4. Sem. coriandri one pound, rad. curcumæ eight ounces, zz. six ounces, sem. cumini, pip. Indic. ana four ounces, pip. nigri three ounces, cinnam., sem. cardam. min. ana one ounce, tamarind. nigr. two pounds.

5. Rice thirty-six pounds, rad. curcumæ 18lb. sem. coriand. sixteen pounds, sem. cymini nine pounds, farinæ sinapis fourteen pounds, pip. nig. twenty-eight pounds, pip. Cayenne three pounds eight ounces.

6. Sem. coriand., rad. curcumæ ana four pounds, zz., pimentæ, pip. Cayenne, capsici bacc. ana one pound, sem. cardam. min. four ounces, macis, caroyph. arom., cinnam. ana one ounce. Used as a seasoning to meat.

Venetian ceruss. Cerussa Veneta, Plumbum album.—Flake white, cawk ana p. æq.

2. *Hamburgh white lead.*—Flake white one hundred weight, cawk two hundred weight.

3. *Best Dutch white lead.*—Flake white one hundred weight, cawk three hundred weight.

4. *Common Dutch white lead.*—Flake white one hundred weight, cawk seven hundred weight.

5. *English white lead.*—Flake white reduced in price by chalk, inferior to the preceding.

Kemp's white for water colours.—Cockscomb spar. q. p. spirit of salt a sufficient quantity; dissolve, add carbonate of ammonia to precipitate the white, wash, and dry in cakes for use.

Pearl powder.—Magistery of bismuth, French chalk scraped fine by Dutch rushes ana p. æq.: cosmetic.

Essential salt of Lemons.—Crem. tart. four ounces, sal. acetosellæ eight ounces: used to take iron moulds out of linen.

English verdigris.—Blue vitriol twenty-four pounds, white vitriol sixteen pounds, sugar of lead twelve pounds, alum two pounds; all coarsely powdered, put in a pot over the fire, and stirred till they are united into a mass.

Rouge.—French chalk ppd. four ounces, ol. amygd. two drachms, carmine one drachm.

2. Safflower, previously washed in water until it no longer gives out any colour, and dried, four drachms, kali pp. one drachm, water

one pint; infuse, strain, add French chalk, scraped fine with Dutch rushes four ounces, and precipitate the colour upon it with lemon juice a sufficient quantity.

Ginger beer powders.—White sugar one drachm two scruples, ginger five grains, natr. pp. twenty-six grains, in each blue paper: acid of tartar one scruple and an half, in each white paper: these quantities are for half a pint of water.

Spruce beer powders.—White sugar one drachm two scruples, natr. pp. twenty six grains, essence of spruce ten grains, in each blue paper; acid of tartar half a drachm, in each white paper; for half a pint of water,

Sodaic powders.—Sodæ carbonatis half a drachm in each blue paper; acid of tartar twenty-five grains in each white paper; for half a pint of water: pleasant, cooling beverages in summer.

Cheltenham salts.—Glauber's salt, Epsom salt, common salt ana twenty-eight pounds; dry in an oven and powder: purgative, from six drachms to one ounce and an half.

Cayenne pepper. Piper Cayenne.—Capsicum q. p. bury in flour, bake till they are dry enough to powder, then, holding them by a pair of pincers, cut them in small pieces, to each ounce add flour one pound, water and yeast a sufficient quantity to make them into small cakes, bake, slice the cakes, bake over again, powder the biscuit and sift it.

Portable Lemonade.—Acid of tartar one ounce, sugar six ounces, ess. limon. one drachm; rub together, divide into twenty-four papers, for a tumbler of water each.

2. Concrete acid of lemons one ounce, white sugar four pounds, ess. limon. two drachms.

Powder for destroying mice.—Rad. helleb. nigri, sem staphisagriæ ana one ounce, oatmeal two pounds, ol. carui thirty drops.

Silver boiling powder.—White argol, common salt, alum ana p. æq.: a small quantity of this powder is put into water, and plate is boiled in it, to which it gives a brilliant whiteness.

Scouring drops.—Ol. tereb. scented with ess. limon.

Furniture oil.—Ol. lini coloured with rad. anchusæ.

Ol. Succini reductum.—Ol. succin. one pound, petrol. Bbd. two pounds.

British oil.—Ol. tereb. eight ounces, petrol. Bbd. four ounces, ol. rorism. four drachms.

2. Ol. tereb. five pounds, asphalt. twelve ounces, ol. lateritii eight ounces.

3. Ol. tereb. five pounds, ol. laterit. ver. eight ounces.

Huile antique a la violette.—Oil of ben, olives, or almonds, scented with orrice, in the same manner as in making essence de jasmin, and then pressed out of the wool or cotton.

Huile antique au mille fleurs.—Oil of ben or almonds, mixed with different essences to the fancy of the perfumer.

Furniture varnish.—White wax eight ounces, ol. terebinth. one pint.

Picture varnish.—Mastich twelve ounces, Ven. turp. two ounces, four drachms; camphire thirty grains, pounded glass four ounces, oil of turpentine three pints and a half; pour off the clear: used to oil paintings.

Gold Varnish for leather.—Turmeric, gamboge ana one scruple and an half, oil of turpentine two pints, add seed lac, gum sandarac ana four ounces, dragon's blood four drachms, Ven. turp. two ounces, pounded glass four ounces, pour off the clear.

Copal varnish.—Oil of turpentine, thickened by keeping, eight ounces, copal two ounces and a half.

2. Oil of turpentine six ounces, oil of lavender two ounces, copal one ounce.

Transparent japan for tin ware.—Oil of turpentine eight ounces, oil of lavender six ounces, copal two ounces, camphire one drachm.

Drying oil.—Linseed oil two pints, litharge or ceruss one ounce; dissolve with heat: added to paints to make them dry the sooner.

Le Blond's varnish for prints.—Balsam. copaibæ four pounds, copal in powder one pound; add by single ounces every day to the balsam, keeping it in a warm place, or the sun, stirring it often: when all is dissolved, add Chio turpentine q. p.

Sheldrake's copal varnish.—Ol. terebinth. rectif. veri one pint, spir. sal. amm. two ounces; mix, add copal in small pieces two ounces: stop the vessel with a cork cut in grooves, bring it quickly to boil so that the bubbles may be counted as they rise, and keep it at that heat: if the least stoppage or overheating takes place, it is in vain to proceed, then leave the vessel till quite cold before you open it, otherwise the varnish will be blown out with violence.

Varnish for coloured drawings.—Canada balsam one ounce, oil of turpentine two ounces: size the drawing first with a jelly of isinglass, and when dry, apply the varnish, which will make them resemble oil paintings.

Common turpentine varnish.—Resin. flav. three pounds, eight ounces; ol. tereb. one gallon.

Sheldrake's oil for painting.—Nut or poppy oil one pint; boil, add ceruss two ounces, when dissolved, add a pint of his copal varnish, previously warmed, and stir till the oil of turpentine is evaporated: gives more brightness than common drying oil, but less than varnish only; loses its drying quality in time, therefore only so much as is sufficient for a month or six weeks' consumption should be made at once.

Black Japan for Leather.—Boiled linseed oil one gallon, burnt umber eight ounces, asphaltum three ounces, boil, and add ol. terebinth. q. s.

Varnish for grates. Brunswick black.—Asphalt. comm. four pounds; melt, add ol. lini two pounds, ol. terebinth. one gallon.

Norfolk fluid for preserving leather.—Linseed oil three pints, res. flav. four ounces, thuris two ounces, cer. flav. twelve ounces; melt add neat's foot oil two pints, ol. terebinth. one pint: used to preserve and soften leather.

White wash balls.—One pound sap. alb. Hisp. three pints of aq. rosar. album. ovor. no. ij, one ounce aq. kali ppi.; boil till hard again, add one scruple ol. lign. rhod. ten drops ol. caryoph. one drachm ess. jasmin. half drachm of ess. neroli, and form into squares.

2. Five pounds of white soap, four ounces of rad. irid. Flor. three ounces amyli, one ounce styrac calam. aq. rosar. q. s.

3. One pound of sap. alb. Hisp. almonds blanched, beat up into a paste with rose water and orange flower water three ounces, one ounce magister. marcasitæ, two drachms of kali ppi. six grains of musk, three grains of cive, one scruple ol. lign. rhodii, one drachm of ess. jasmin.

4. *Cream balls.*—Seven pounds of white curd soap, one pound amyli, water, a sufficient quantity; beat it together, weigh into ounce balls, and roll in pulv. amyli.

5. White soap, starch ana one pound, ess. limon. four drachms, aq. rosar. eight ounces; make into balls of three ounces and a half each.

Red mottled washballs.—Cut white soap into small square pieces, roll them in vermillion, and squeeze the pieces together into balls, without mixing them more than is necessary.

Blue mottled wash balls.—In like manner, rolling the pieces in powder blue.

Windsor soap.—Hard curd soap, melted and scented with ol. carui and ess. Bergamotte; an inferior sort is made with ol. carui only.

Starkey's Soap.—Made by rubbing warm kali ppd. with oil of turpentine, adding a little water.

Macquer's acid soap. Sapo vitriolicus.—Four ounces Sapon. Ven. ol. vitrioli, q. s. add the acid by degrees to the soap rendered soft by a little water, continually rubbing the mass in a mortar: detergent; used when alkalies would be prejudicial.

Varnish for plaister casts.—Sapon. alb., ceræ albæ ana half an ounce, boiling water, two pints.

Blacking balls.—Adep. porc., ceræ fl. ana one ounce, ebor. usti, fulig. lamp., sacch. rubr. ana eight ounces, double glue size four ounces, water four ounces.

2. Ebor. usti eight ounces, gum. tragac. one ounce, sacchr. candi two ounces, water, eight ounces: used for blacking leather.

Pommade de la Jeunesse.—Pomatum mixed with pearl white, or magistery of bismuth: turns the hair black.

Lip Salve.—Ceræ alb. four ounces, ol. oliv. five ounces, sperm. ceti four drachms, ol. lavand. twenty drops, rad. anchusæ two ounces.

2. Ol. oliv. opt. two ounces, ceræ alb. sperm. ceti ana three ounces, rad. anchusæ six drachms; melt, strain, add ol. lign. rhod. three drops.

3. Ol. amygd. six ounces, sperm. ceti, three ounces, ceræ alb. two ounces, rad. anchusæ one ounce, bals. Peruv. two drachms.

4. Ol. amygd., sperm. ceti, ceræ albæ, sacch. candi albi, of each p. æq : this is white, the others are red.

Pommade Divine.—One pound eight ounces of beef marr w, cinnamon one ounce and a half, stor. calam., benzoini, rad. irid. Flor. ana one ounce, caryoph., nuc. myrist. ana one drachm.

2. Sevi ovilli one pound eight ounces, stor. calam., benz., rad. irid. Flor., rad. cyperi, cinnam., caryoph. arom., nuc. mosch. ana nine drachms, keep melted in a gentle heat of some time, then strain.

3. Sevi ovilli four pounds, ceræ alb. one pound, ess. Bergam., ess. limon. of each one ounce and an half, ol. lavand., ol. origani, of each four drachms.

Dressing for leather to render it water proof.—Ol. lini one pound, ceræ fl., tereb. comm. ana two ounces, picis Burg. one ounce.

2. Ol. lini one pound, sevi eight ounces, ceræ fl. six ounces, resinæ fl. one ounce.

Anti-attrition—Hog's lard ten pounds, camph. four ounces, black lead, sufficient quantity to colour it; used to rub on iron to prevent rust, and diminish friction.

Vanherman's fish-oil paints.—The oil for grinding white is made by putting litharge and white vitriol ana twelve pounds, into thirty-two gallons of vinegar, adding, after some time, a ton of whale, seal, or cod oil ; the next day the clear part is poured off, and twelve gallons of linseed oil, and two gallons of oil of turpentine, are added.

2. The sediment, left when the clear oil was poured off, mixed with half its quantity of lime water, is also used under the name of prepared residue oil for common colours.

3. *Pale green.*—Six gallons of lime water, whiting and road dust of each one hundred weight, thirty pounds of blue black, twenty-four pounds yellow oker, wet blue (previously ground in prepared residue oil) twenty pounds ; thin with one quart of ppd. residue oil to each eight pounds, and the same quantity of linseed oil.

4. *Bright green.*—One hundred weight of yellow oker, one hundred and a half of road dust, one hundred weight of wet blue, ten pounds of blue black, six gallons of lime water, four gallons of ppd. fish oil, ppd. residue oil and linseed oil, seven and a half gallons of each.

5. *Lead colour.*—One hundred weight of whiting, five pounds of blue black, twenty-eight pounds of white lead ground in oil, fifty-six pounds of road dust, five gallons of lime water, two and a half gallons of ppd. residue oil.

6. *Brown red.*—Eight gallons of lime water, one hundred weight of Spanish brown, two hundred weight of road dust, four gallons of ppd. fish oil, ppd. residue oil and linseed oil, of each four gallons.

7. *Yellow.*—Put in yellow oker instead of Spanish brown, as in the last.

8. *Black.*—Put in lamp black or blue black.

9. *Stone colour.*—Four gallons of lime water, one hundred weight of whiting, twenty-eight pounds of white lead ground in oil, fifty-

six pounds of road dust, two gallons ppd. fish oil, ppd. residue oil and linseed oil, three and a half gallons of each. The cheapness of these paints, and the hardness and durability given to them by the road dust (or ground gravel) has brought them into great use for common out-door painting.

Black Ball.—Bees' wax eight ounces, tallow one ounce, gum Arab. one ounce, lamp black a sufficient quantity.

Blackman's Oil Colour Cakes.—Grind the colours first with oil of turpentine, and a varnish made of gum mastich in powder four ounces, dissolved without heat in a pint of oil of turpentine; let them dry, then heat a grinding stone, by putting a charcoal fire under it, grind the colours upon it, and add an ointment made by adding melted spermaceti three pounds, to a pint of poppy oil, take a piece of the proper size, make it into a ball, put this into a mould and press it. When these cakes are used, rub them down with poppy oil, oil of turpentine, or any other convenient vehicle.

Blackman's Colours in bladders.—Are prepared with the spermaceti mixture like his oil colour cakes, but the proportion of oil is larger.

Furniture Balls.—Ol. lini one pint, rad. anchusæ two ounces, heat together, strain, add ceræ fl. eighteen ounces, resinæ fl. two ounces.

Red Sealing Wax.—Gum lac two pounds, vermilion four ounces, ol. tereb., ol. oliv. ana eight ounces, roll in cakes, and polish with a rag till quite cold.

2. Shell lac five pounds, resinæ fl. three pounds, ol. tereb. one pound, vermilion twelve ounces, chalk ppd. four ounces.

3. Resinæ fl. six pounds, shell lac two pounds, tereb. Venet. two pounds, vermilion eight ounces.

4. Shell lac, resinæ fl. ana four pounds, tereb. Ven. one pound, add vermilion or bole Armen. ppd. q. p.

Black Sealing Wax.—As the red, using lamp black instead of vermilion.

Seal Engraver's Cement.—Common rosin and brick dust; it grows harder every time it is melted, but always remains inferior to Botany Bay cement.

Botany Bay Cement.—Yellow gum and brick dust ana p. æq.; used to cement China ware.

Gilder's Wax.—Ceræ fl. one pound and eight ounces, ærug. æris, vitrioli albi ana eight ounces, colcothar. two pounds and twelve ounces; the dry species must be powdered very fine; borac. four ounces may be added.

2. Ceræ fl. fifteen pounds, colcothar. seven pounds, ærug. æris, vitrioli albi ana three pounds and eight ounces, boracis eight ounces.

3. Ceræ fl., colcothar. ana four pounds, ærug. æris two pounds, borac. usti, alum. usti ana two ounces.

4. Colcothar. eighteen pounds, ceræ fl. ten pounds and eight ounces, ærug. æris, vitrioli albi ana three pounds and eight ounces.

Issue Peas. Pisa pro fonticulis.—Ceræ fl. one pound, rad. curcumæ eight ounces, rad. irid. Flor. four ounces, tereb. Ven. a sufficient quantity, make into peas.

2. Ceræ fl. six ounces, rad. irid. Flor. two ounces, vermilion four ounces, tereb. Ven. a sufficient quantity; form into peas.

3. Ceræ fl. six ounces, ærug. æris, rad. helleb. albi ana two ounces, cantharidum one ounce, rad. irid. Flor. one ounce and a half, tereb. Ven. a sufficient quantity: this last is caustic, and will open issues itself, the others are used to put into issues that begin to close up, to keep them open longer.

Issue Plasters.—Ceræ fl. half a pound, minii, tereb. Chiæ ana four ounces, cinnab., rad. irid. Flor. ana one ounce, mosch. four grains; melted, spread upon linen, polished with a moistened calendering glass rubber, and lastly cut in small squares.

2. Diachyl. simpl. one pound, rad. irid. Flor. one ounce; spread, and polished.

3. Diachyl. simpl. two pounds, pic. Burg., sarcocollæ ana four ounces, tereb. comm. one ounce; spread and polished.

Corn Plasters.—Ceræ fl. two pounds, pic. Burgund. twelve ounces, tereb. comm. six ounces, ærug. ppæ. three ounces; spread on cloth, cut and polished.

Bougies.—Catgut, of different thickness, dipped in emplastr. hydrargyri, and rolled smooth upon a slab.

2. Pieces of old linen about a foot long, wide at one end, and tapering to the other, dipped in empl. hydrargyri, empl. saponis, or diachyl. simpl. and rolled up while the plaster is yet warm, upon a heated slab.

3. *Elastic gum Bougies.*—Catgut dipped repeatedly in a solution of elastic gum or Indian rubber, in ether or naphtha, until a sufficient thickness of gum is deposited upon the catgut.

Elastic gum Catheters.—A bougie, made of fine catgut, very thickly coated with wax, bent to the proper curve, is dipped repeatedly in the ethereal solution of elastic gum, until a sufficient thickness of gum is deposited upon the bougie, it is then dried perfectly in a warm room or stove; and finally boiled in water to melt out the wax and allow the catgut to be withdrawn.

2. A wire bent to the proper curve is wrapped round spirally, the turns overlapping each other, with a thin ribband of elastic gum, whose surface has been softened by dipping in boiling water, or still better in ether, or in a solution of camphire in spirit of nitre to which some spirit of wine has been added; over this is wound a silk ribband, and over that another worm of packthread to bind down the whole: when the gum is judged to be dry enough, the packthread and ribband are removed, the catheter dipped for a moment in boiling water to expand it, and allow the wire to be withdrawn, and one or two holes are then made at the close end.

3. A fine tissue of silk is wove upon a wire properly bent; and the wire thus clothed is dipped in the ethereal solution of elastic gum, and treated as in the first method; when properly covered and dried, the wire is withdrawn, and the aperture at the closed end made.

Phosphorus bottles.—Phosphorus two drachms, lime one drachm,

mixed together, put into a loosely stopped phial, and heat it before the fire, or in a ladle of sand, for about half an hour.

2. Phosphorus one drachm, cera alba fifteen grains, put it into a bottle under water, and melt them together, let the water cool, and as it begins to grow solid, turn the bottle round, that the sides may be coated, then pour out the water, and dry it in a cool place.

Matches for instantaneous light.—Oxymuriat of potash, flowers of sulphur, ana half a scruple, vermilion two grains, a sufficient quantity of oil of turpentine to make a paste, with which coat the ends of slips of wood, previously dipped in oil of turpentine and dried; when these matches are plunged into oil of vitriol and immediately withdrawn, they take fire instantaneously. To prevent the oil of vitriol from spilling, if the bottle should accidentally fall on one side, pounded asbestus or sand is put into the bottle to soak up the acid.

2. Oxymuriat of potash nine grains, sugar three grains, flowers of sulphur two grains, vermilion one grain, flour two grains, a sufficient quantity of spirit of wine; the wood to be previously primed with camphire dissolved in spirit of wine.

Sponge tents.—*Turundæ intumescentes.*—Soft sponge is dipped in melted wax, and squeezed in a press while warm, when cold it is taken out, and cut into the required form; used to dilate fistulous ulcers by its expanding force when softened by warmth and moisture.

Court plaister, sticking plaister.—Black silk is strained and brushed over with a solution of one ounce of isinglass, in twelve ounces of proof spirit, to which two ounces of tinct. benz. is added: when dry, this is repeated five times more, after which, two coats are given it of a solution of four ounces of tereb. Chia in six ounces of tinct. benz. which renders it less liable to crack; but some finish it with a simple tincture of black balsam of Peru.

Medicine chests for ships that carry a surgeon.—Some idea of what ought to be shipped for a voyage, may be formed from the following lists which the physician of Greenwich Hospital, Dr. Blane, judged necessary for the service of one hundred men for twelve months, viz.

1. *Pharmaceutic articles.*—Cort. Peruv. ten pounds, if for a warm climate twenty pounds, Glauber's or Epsom's salt ten pounds, senna two pounds, ipecac. four ounces, tartar. emetic one ounce and a half, calomel two ounces and a half, opium one ounce, aloes half an ounce, gum ammoniac two ounces, bals. copaibæ three ounces, cantharides one ounce, capsicum three ounces, tinct. benz. comp. four ounces, camphire three ounces, castor one ounce and a half, camomile fl. or hops two pounds, cinnamon one ounce, chalk ppd. or oyster shells six ounces, conserve of roses eight ounces, confectio cardiaca two ounces, extract. cathart. half an ounce, extr. conii three ounces, extr. hæmatoxyli one ounce, gentian root five ounces, ginger three ounces, gum arabic four ounces, gum guaiacum three ounces, jalap one ounce and a half, laudanum (tinct.) four ounces, linseed one pound, magnesia (carbonat) six ounces, manna eight ounces,

mustard seed whole eight ounces, myrrh four ounces, quicksilver two ounces, corrosive sublimate one ounce, sal nitri eight ounces, almond oil one pint, castor oil eight ounces, linseed oil three pints, oleum menthæ one ounce, Jamaica pepper four ounces, quassia eight ounces, volatile salts two ounces, sal martis half an ounce, kali ppi. ten ounces, Venice soap eight ounces, sarsaparilla three pounds, Virginia snake root four ounces, spermaceti four ounces, spirit of wine one pint, spirit of vitriol eight ounces, ammoniæ acetas (or materials for preparing it) two pints, oil of turpentine four ounces, dried squills half an ounce, flowers of sulphur one ounce, golden sulphur of antimony half an ounce, cream of tartar one pound, vinegar six pints, white vitriol one ounce, wormwood one pound, flowers of zinc two drachms.

2. *Surgical applications.*—Simple cerate six pounds, spermaceti ointment six pounds, red precipitate one pound, blue vitriol eight ounces, blister plaister six pounds, extr. saturni four pounds, sugar of lead four pounds, cantharides in powder one pound; strapping, lint, tow, rags at discretion.

3. *Dietetic articles.*—Barley three hundred weight, eggs greased and packed in salt twenty dozen, extract of spruce twelve pounds, lemon juice clarified and rum added to make it keep five gallons, raisins fifty pounds, rice two hundred weight, coarse sugar two hundred weight, sago twenty pounds, salep powder ten pounds, portable soup fifty pounds, tamarinds ten pounds, white wine three hundred gallons, red wine one hundred gallons.

Medicine chests for plantation service.—Dancer, in his Medical Assistant, gives the following list of medicines as necessary, (along with indigenous remedies) for one hundred negroes for a year: Aloes eight ounces, alum eight ounces, Peruvian bark four pounds, balsam copaibæ eight ounces, cantharides eight ounces, calomel one ounce, camphire eight ounces, catechu one pound, camomile flowers one pound, elixir of vitriol eight ounces, elixir paregoric eight ounces, extr. cathart. half an ounce, flowers of sulphur one pound, flowers of zinc one ounce, gamboge one ounce, gum ammoniac four ounces, gum arabic eight ounces, ipecacuanha four ounces, iron filings ppd. two pounds, jalap four ounces, linseed two pounds, liquorice eight ounces, magnesia alba four ounces, mezereon four ounces, myrrh four ounces, sal nitri four ounces, spirit of nitre four ounces, opium four ounces, oil of aniseed two ounces, olive oil four pints, oil of peppermint one ounce, oil of turpentine one pound, yellow basilicon one pound, simple cerate one pound, mercurial ointment four ounces, gum plaister eight ounces, mercurial plaister four ounces, sumach two ounces, sal ammoniac four ounces, Glauber's salt ten pounds, kali ppd. eight ounces, sal martis two ounces, senna four ounces, snake root four ounces, spirit of sal ammoniac six ounces, ammoniæ acetas two pints, double distilled lavender water four ounces, Hoffman's anodyne liquor four ounces, sweet spirit of nitre four ounces, emetic tartar half an ounce, rhubarb four ounces, Strasburgh turpentine four ounces, vinegar two gallons, extractum satur-

ni eight ounces, white vitriol two ounces, blue vitriol four ounces, verdigris eight ounces, red precipitate four ounces, corrosive sublimate half an ounce.

2. *Necessaries.*—One large clyster syringe, one small do. six for injections, four lancets, one tooth instrument, three or four eye cups, one dozen bougies in sorts, three dozen phials with corks, one paper of pill boxes, one set of scales and weights, lint and tow.

Lee's Windham antibilious pills.—P. gambog. three pounds, aloes soc. two pounds, sapon. dur. one pound, sal. nitri half a pound, extr. of cow parsnip one pound. Beat them into a mass with a sufficient quantity of sp. vin. rect.

Lee's New-London antibilious pills.—Pulv. aloes soc. twelve ounces, pulv. scammon. A. six ounces, pulv. gambog. four ounces, pulv. jalap three ounces, calomel pp. five ounces, sapon. Castil. one ounce, syr. buckthorn, one ounce, muc. gum. arab. seven ounces. M. ft. mass S. A. When incorporated, divide two drachms of the mass into twenty-four pills.

Preparation of *Emetin*, as recommended by Mr. Pelletier, in the Codex Medicamentarius of Paris:

Take of the root of ipecacuan one ounce, sulphuric ether two ounces. Let the powder be macerated with a gentle heat, for some hours, in a distilling apparatus; let the portion which remains be triturated and boiled in four ounces of alcohol (40° Baumé), having previously been macerated in it; let the liquor filter, and let the remainder be treated with fresh portions of alcohol, as long as it takes up any thing from the root. Mix all the solutions, and evaporate to dryness. Let this alcoholic extract be macerated in cold water, (distilled) in order that every thing soluble in that menstruum may be dissolved; filter, and evaporate to dryness. This extract is *emetin*, and is equivalent to about one-sixth or one-seventh of the root.

Of the preparation of *Morphia*, from the same; *Robiquet's* process.

Three hundred parts of pure opium are macerated, during five days, in one thousand parts of water; it is then filtered, and there are added fifteen parts of perfectly pure magnesia, entirely free from acid; the mixture is boiled for ten minutes, and the sediment which forms is separated by the filter, after which it is washed with cold water, until the water passes off clear. It is then treated alternately with hot and cold alcohol, until it ceases to take up any more of the colouring matter, after which it is to be treated with boiling alcohol (32° Baumé) for a few minutes. The solution, on cooling, will deposit crystals of morphia; a repetition of the treatment with boiling alcohol will procure a fresh portion of crystals, and the process is to be continued, until they cease to be furnished.

The second method is that of Sertuerner. The chief difference between them is, that in the latter, ammonia is used instead of magnesia, and to the sediment, separated as before, there is added so much sulphuric acid, as is sufficient to convert the morphia into a sulphat, which is decomposed by a further addition of ammonia. The precipitate is dissolved in boiling alcohol, and crystallizes on cooling.

See the process at length, in the "Annales de Chimie, 1817."

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